INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR COMPACT AIR & COMPACT HEAT

Applicable to program version 3.00 and newer versions

COMPACT Air

COMPACT Heat

The document was originally written in Swedish.

Content

1 GENERAL 3
1.1 Field of Application 3
1.2 Mechanical Design 3
1.3 Control System 3
1.4 Environmental Documentation 3
1.5 The Components of the Air Handling Units 4
1.5.1 COMPACT Air 4
1.5.2 COMPACT Heat 5

2 SAFETY PRECAUTIONS 6
2.1 To Start/Stop the Air Handling Unit 6
2.2 Risks 6

3 INSTALLATION 7
3.1 General 7
3.2 Transport Within the Site/Sectionalizing 7
3.2.1 To Split the Air Handling Unit into Separate Sections to Facilitate Transport Within the Building Site. 7
3.3 Location 8
3.4 To Fit the Kick-protection Base 8
3.5 To Install the Air Recirculation Section/ Louvre Damper (applies to COMPACT Heat only) 8
3.6 Duct Connection 8
3.7 Exterior Wall Hood 9
3.8 Existing Ventilation 9
3.9 Serving More than One Room 9
3.9.1 Extract Air Intake 9
3.9.2 Transfer Air 9
3.10 Connection to the Electric Power Grid 9
3.11 To Connect External Cables 9
3.12 To Adjust the Supply Air Discs 10

4 COMMISSIONING 11
4.1 General 11

5 CONTROL DISPLAY AND USING THE MENU 12
5.1 Control display 12
5.1.1 General: 12
5.1.2 The Buttons 12
5.1.3 Display screen 12
5.1.4 Abbreviations Used 12

6 MAIN MENU 1 13
6.1 The Menu Tree 13
6.2 General 14
6.3 Selection of Language 14
6.4 Normal Operation 14
6.5 Extended operation 14
6.6 Airing 14
6.7 Heating (applies to COMPACT Heat only) 14
6.8 Heating + Recirculation (applies to COMPACT Heat only) 14
6.9 Main Menu 2 14

7 MAIN MENU 2 15
7.1 Menu tree 15
7.2 Changing Operating Mode 16
7.3 Settings 16

8 USER LEVEL 17
8.1 Temperature 17
8.1.1 Readings 17
8.1.2 Settings 17
8.2 Air flow/Pressure 18
8.2.1 Readings 18
8.2.2 Settings 18
8.3 Switch clock 19
8.4 Filters 19
8.4.1 Readings 19
8.4.2 To Calibrate the Filters 19
8.4.3 Calibration - Rotary Heat Exchanger 19
8.5 Air Adjustment 20
8.6 Alarms 20

9 INSTALLATION LEVEL 21
9.1 Menu Survey 21

10 FUNCTIONS 22
10.1 Temperature 22
10.2.1.1 ERS Regulation 23
10.2.2 Airing Function 24
10.2.2.1 Automatic Airing 24
10.2.2.2 Manual Airing 24
10.2.3 Summer Night Cooling 25
10.2.4 Intermittent Night-time Heating (applies to COMPACT Heat only) 26
10.2.5 Morning BOOST (applies to COMPACT Heat only) 27
10.2.6 Setpoint Temperature Displacement 27
10.2.7 Heating (applies to COMPACT Heat only) 28
10.2.8 External Temperature Sensors 28
10.3 Flow/Pressure 29
10.3.1 Fan Regulation 29
10.3.1.1 Flow Regulation 29
10.3.1.2 Demand Regulation (Control) 29
10.3.1.3 Slave Control 29
10.3.1.4 Clean Air Control 30
10.3.2 Outdoor Temperature Compensation 31
10.3.3 Downspeed Control of Fan Speed to Min. Set Point, Airflow 32
10.4 To Activate the Filter Monitoring Function 32
10.5 Operation 33
10.5.1 Switch clock 33
10.5.2 Extended Operation 33
10.5.3 Summer time/Winter time 33
10.6 Heating 34
10.6.1 Heat exchanger 34
10.6.1.1 Defrosting the rotary heat exchanger 34
10.6.1.2 Heating BOOST (applies to COMPACT Heat only) 35
10.7 Cooling(Applies to an air cooler installed in the outdoor air duct only) 36
10.7.1 Operation 36
10.7.2 Temperature Regulation (Control) 36
10.7.3 Periodic Operation 37
10.7.4 Regulation Speed 37
10.7.5 Outdoor Temperature Limit 37
10.7.6 Restart Time 37
10.7.7 Cooling Min Air Flow 37
10.7.8 Neutral Zone 37
10.7.9 Cooling BOOST 37
10.8 Input/output connections 38
10.9 IQnomic Plus 39
10.10 All Year Comfort 40

11 AUTOMATIC FUNCTIONS 41
11.1 General 41
11.1.1 Starting Sequence 41
11.1.2 Cooling Recovery 41
11.1.3 Zero Point Calibration 41
11.1.4 Additional cooling – Electric Air Heater 41
11.1.5 Additional running - Heat Exchanger 41
11.1.6 Density-corrected Airflow 41
11.1.7 BOOSTER-function (Applies to COMPACT Heat only) 41

12 READINGS 42

13 MANUAL TEST 42

14 ALARM SETTINGS 43
14.1 Fire Alarms 43
14.2 External Alarms 43
14.3 Alarm Limits 43
14.4 Alarm Priority 43

15 CONTROL DISPLAY 44
15.1 Language 44
15.2 Air flow unit 44
15.3 Min/Max Adjustment 44
15.4 Base Settings 44

16 COMMUNICATION 45
16.1 EIA-485 45
16.2 Ethernet 45

17 SERVICE LEVEL 45

18 MAINTENANCE 46
18.1 Filter Change 46
18.1.1 To remove the Filters 46
18.1.2 To fit new filters 46
18.2 Cleaning and Inspection 46
18.2.1 General 46
18.2.2 Filter Space 46
18.2.3 Heat exchangers 46
18.2.4 Fans and Fan Space 46
18.3 Performance Checks 46
18.4 Damper Actuator for the Change-over Damper 46

19 ALARMS AND FAULT TRACING 47
19.1 General 47
19.1.1 A and B Alarms 47
19.1.2 To reset the alarm 47
19.1.3 To Change the Alarm Settings 47
19.2 Alarm Descriptions with Factory Settings 48

20 INFORMATIVE MESSAGES 52

21 TECHNICAL DATA 53
21.1 Dimensions, COMPACT Air 53
21.2 Dimensions, COMPACT Heat 53
21.3 Electrical Equipment Cubicle 54
21.3.1 Internal Connections, COMPACT Air 55
21.3.2 Internal Connections, COMPACT Heat 56
21.3.3 Connection to Terminal Blocks 57
21.4 Electrical Data 58
21.4.1 Air Handling Unit 58
21.4.2 Fans 58
21.4.3 Electrical equipment cubicle 58
21.4.4 Heat Exchanger Motor 58
21.4.5 Control Inaccuracy 58

22 APPENDICES 59
22.1 Compliancy Declaration 59
22.2 Commissioning Record 60
22.3 Ecodesign data 68

Registered design. The company reserves the right to make design changes without prior notice.

1 GENERAL

1.1 Field of Application

The COMPACT Air and COMPACT Heat units are complete air handling units that can be installed directly in the room to be ventilated. The ducts for outdoor air and exhaust air should be connected to the top of the unit and should be arranged to lead out through the wall. Other than that, you need only connect the unit to the mains electric supply.

The installation work can be carried out very quickly and easily and if the task of cutting openings through the wall is not complicated, the unit can be operational in just a few hours. It is also simple to relocate the air handling unit if the nature of the activities conducted in the room changes.

The ventilation is very effective thanks to the displacement air distribution method used. The built-in control equipment has several functions for economic operation.

The COMPACT Air and COMPACT Heat units are designed for comfort ventilation and can be used in classrooms, day nurseries, conference halls, smaller offices, workrooms, shops, restaurants and similar public premises.

The difference between the COMPACT Air and the COMPACT Heat units is that the COMPACT Heat units can also be used for heating.

It is important keep all the special characteristics of the air handling units in mind when planning them into the project, installing, adjusting and operating them to fully obtain all the benefits the COMPACT system has to offer.

The unit must be installed indoors.

Important!

Always read the safety precautions in Section 2 that explain the risks involved in running the unit and designate who shall be permitted to operate and service the unit, and carefully follow the installation instructions provided in each paragraph.

The product identification plates are located inside the room unit and on the unit's rear side. See Sections 1.5.1 and 1.5.2 respectively. Refer to the particulars on the product identification plate when you contact Swegon.

1.2 Mechanical Design

The COMPACT is available in one physical size and for two airflow ranges.

Its sheet steel exterior is painted white, NCS S 0502-G. The decorative strips and cover plate around the control display are dark grey, NCS S6010-R90B. The inner skin is predominantly made of aluminium-zinc plated sheet steel. The casing has 30 mm thick intervening mineral wool insulation; the inspection doors have 50 mm thick insulation.

The COMPACT Air and the COMPACT Heat are equipped with pleated, Class F7 filters.

The type RECOnomic rotary heat exchanger is variable speed controlled and has a peak temperature efficiency of 85%.

The supply air and extract air fans are direct-driven plug fans. The fans are equipped with EC motors that provide high efficiency across the entire operating range.

1.3 Control System

The IQnomic control system is microprocessor-based and is integrated into the unit. It controls and regulates the fans, heat exchanger, temperatures, airflows, operating times and a large number of internal and external functions as well as alarms.

1.4 Environmental Documentation

Environmental Documentation with the Dismantling Instructions for recycling and the Environmental Declaration can be downloaded from our home page: wwww.swegon.com.

The air handling unit is design in such a way that it can be dismantled into its natural parts for scrapping. When the unit has ended its useful product life, the services of an accredited recycling company should be utilized for disposal.

Approximately 94% of the parts in COMPACT air handling units is recyclable.

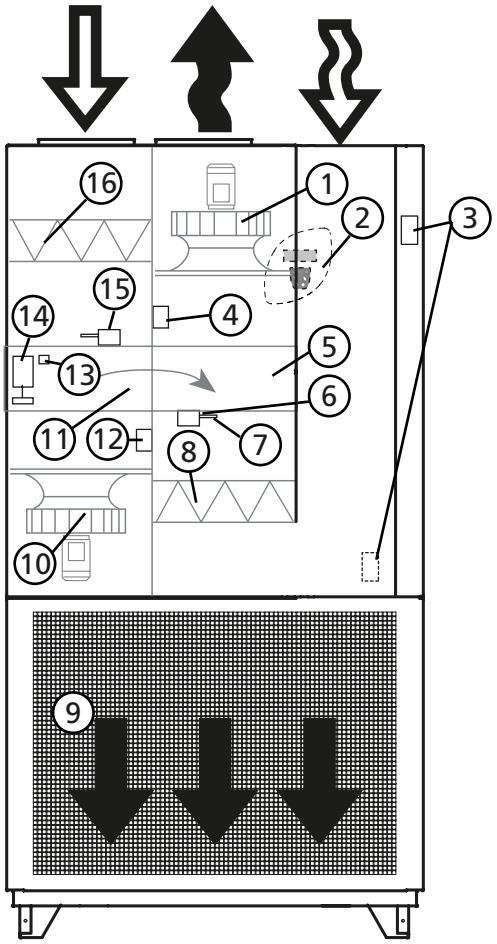
Swegon AB is associated with the REPA Register, No. 5560778465.

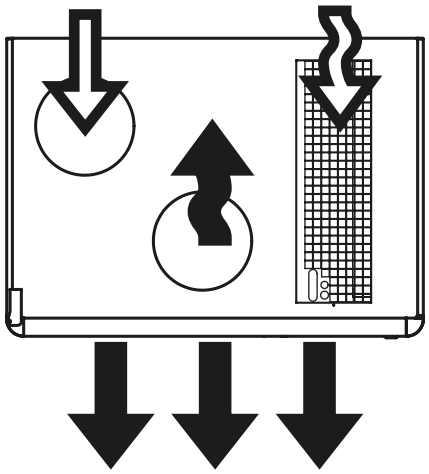
Contact Swegon AB, Phone: +46 (0)512-322 00, if you have any questions regarding the dismantling instructions or the air handling unit's impact on the environment.

1.5 The Components of the Air Handling Units

1.5.1 COMPACT Air

The individual components each specified below in a simplified and diagrammatical description.





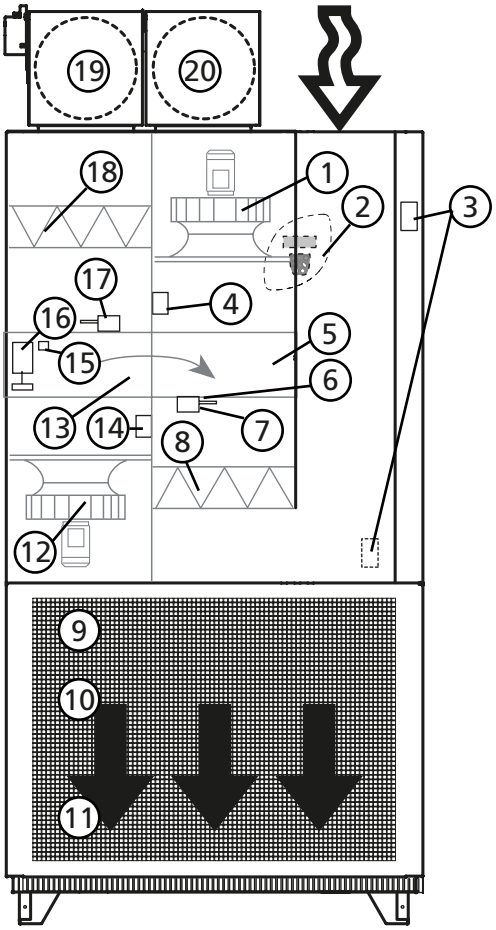
The arrangement of the components and their designations

1 Extract air fan with motor and built-in controller
2 Control display (on the inspection door)
3 Product identification plate
4 Pressure sensor, extract air fan
5 Electrical equipm. cubicle with control unit
6 VOC sensor
7 Sensor, extract air temperature
8 Extract air filter
9 Sensor, supply air temperature (inside the lower section)
10 Supply air fan with motor and built-in controller
11 Heat exchanger
12 Pressure sensor, supply air fan
13 Sensor, rotation monitor
14 Drive motor, heat exchanger
15 Sensor, outdoor temperature
16 Supply air filter

Registered design. The company reserves the right to make design changes without prior notice.

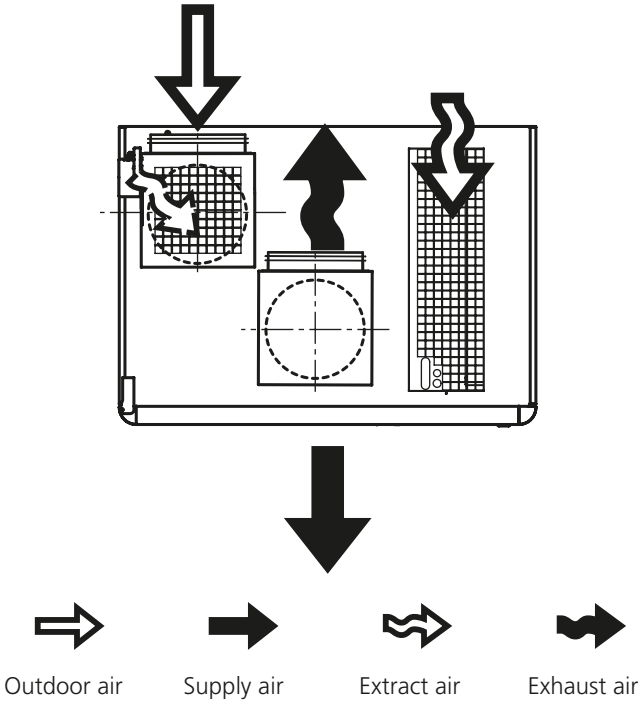
1.5.2 COMPACT Heat

The individual components each specified below in a simplified and diagrammatical description.



The arrangement of the components and their designations

1 Extract air fan with motor and built-in frequency inverter
2 Control display (on the inspection door)
3 Product identification plate
4 Pressure sensor, extract air fan
5 Electrical equipm. cubicle with control unit
6 VOC sensor
7 Sensor, extract air temperature
8 Extract air filter
9 Electric air heater, (inside the lower section)
10 Sensor, supply air temperature (inside the lower section)
11 Change-over damper with actuator (inside the lower section)
12 Supply air fan with motor and built-in controller
13 Heat exchanger
14 Pressure sensor, supply air fan
15 Sensor, rotation monitor
16 Drive motor, heat exchanger
17 Sensor, outdoor temperature
18 Supply air filter
19 Recirculation section with actuator
20 Louvre damper



2 SAFETY PRECAUTIONS

All staff concerned must acquaint themselves with these instructions before beginning any work on the unit. Any damages to the unit or parts of it due to improper handling or misuse by the purchaser or the fitter cannot be considered subject to guarantee if these instructions have not been followed correctly.

Warning

Only an authorised electrician or qualified service personnel trained by Swegon shall be permitted to carry out electrical installation on the air handling unit or wire external functions to it.

2.1 To Start/Stop the Air Handling Unit

The air handling unit should normally be started and stopped via the control display. Note that the control equipment of the air handling unit is still electrified after the unit has been switched off via the control display.

Pull out the plug connector before servicing the unit if not otherwise specified in the pertinent instructions or in the event of an emergency.

2.2 Risks

Warning

Before carrying out any work, make sure that the power supply to the air handling unit has been isolated.

Risk areas with moving parts

Typical moving parts are fan impellers and drive pulleys of the rotary heat exchanger. Safety guards are provided in front of these components. If the ducts are not connected to the fan outlet, these must be fitted with a safety guard (wire mesh screen).

Only a qualified electrician or trained service technicians shall be allowed to remove the safety guards.

Registered design. The company reserves the right to make design changes without prior notice.

3 INSTALLATION

3.1 General

The air handling unit is delivered with packaging, standing on a wooden pallet. The kick-protection base is supplied in kit form laying inside a carton placed in the extract air duct of the air handling unit. The recirculation section and louvre damper, if ordered, are supplied unmounted. For assembly instructions see Section 3.5.

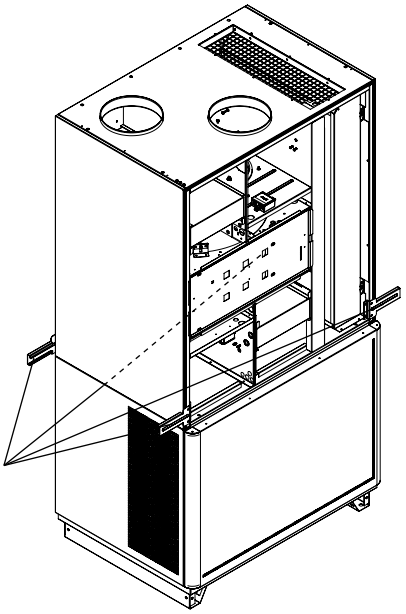
Any accessories that have been ordered with the unit are supplied in unmounted condition.

3.2 Transport Within the Site/Sectionalizing

The Compact Air unit is always supplied as one complete air handling unit. If transporting the unit within the site proves difficult, the unit can be split into sections as described below:

3.2.1 To Split the Air Handling Unit into Separate Sections to Facilitate Transport Within the Building Site.

1. Open the inspection door using the spanner supplied with the unit.
2. Dismantle the safety guard in front of the heat exchanger. Disconnect the communication cable of the control display by removing the quick connector on the control unit connection (marked HMI) and bundling strap. Pull the communication cable out all the way to the inspection door.



Lifting handles, (set of 4)

3. Remove the screws of the upper hinge and lift off the inspection door.
4. Fasten the lifting handle (supplied, located below the extract air filter) with screws, see illustration.
5. Remove the insulation and the safety guard from the supply air fan.
6. Pull the quick connectors of the cables to the supply air fan apart to disconnect them.
7. Dismantle the supply air fan by backing off the two screws in the rear part of the fan suspension bracket. Do not unscrew them completely. Unscrew and remove the screws in the front part of the suspension bracket. Withdraw the entire fan package. The suspension bracket will then let go from the rear screws.
8. Slightly turn the fan package and withdraw it from the unit.
9. If you need to further reduce the weight of the upper section, you can also dismantle the extract air fan by repeating Items 5-8 above.
10. Remove the cable protection on the bottom of the fan compartment.
11. If the air handling unit is fitted with an electric air heater, unscrew the screws of this component, lift it up and place it loosely inside the air handling unit.
12. Remove the screws that secure the mounting bracket of the supply air sensor. Lift up the mounting bracket and the supply air sensor and place them to rest unsecured inside the unit.
13. Remove the four screws (M8) in the bottom of the upper section. These screws hold both sections together.
14. Lift off the upper section.
15. Now each section can be individually transported.
16 Reassembly should be carried out following the above steps in the reverse order.

3.2.2 To Remove the Door and Front Grille

1. Remove the safety guard in front of the heat exchanger.
2. Disconnect the communication cable of the control display by removing the quick connector on the control unit connection (marked HMI) and bundling strap. Pull the communication cable out all the way to the inspection door.
3. Remove the screws of the upper hinge and lift off the inspection door.
4. Remove the four screws that hold the front grille of the upper section, using a 6 mm Allen wrench.
5. Reassembly should be carried out following the above steps in the reverse order.

3.3 Location

To achieve optimal operating economy it is important to design the duct system with as low a pressure drop as possible. Therefore the designer should focus on arranging the duct runs as short as possible so that there will not be more duct bends than necessary. The duct connections on the Compact Air/Heat units are arranged to enable ducts to be run in any direction without being in the way of one another.

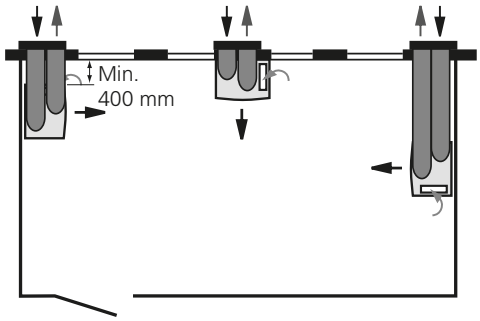
The design of the hoods, grilles, etc. for outdoor air/exhaust air are also important. The specially constructed exterior wall hood for the Compact Air/Heat units is designed in such a way that minimizes pressure losses.

Examples of alternative locations of the Compact Air/Heat unit in a room are shown below.

Important! The air handling unit should be located at least 400 mm on either side from a wall to avoid acoustic problems. See the illustration below.

For the sake of comfort, the nearest workplace should be 1 metre from the unit. However note that at least 1,200 mm open space is required in order to be able to open the inspection door.

In the case of a COMPACT Heat unit, make sure that you provide open space in front of the air handling unit to enable long throw lengths when the unit is operating in the BOOSTER mode (flow Boost).



3.4 To Fit the Kick-protection Base

Secure the 6 screws supplied halfway into the tapped holes on the base beam of the air handling unit.

Then fit the side plates of the kick protection base (the two short plates) by pushing the keyhole fasteners over the screws from the front side of the unit. Now the side plate should hang loosely on the screws.

Fit the front side of the kick protection plate (the long plate) on the two screws on the front side. Now the front plate should hang loosely on the screws.

Adjust the position of the plates and tighten the screws.

Fasten the cover plugs, supplied, in the holes over the screws.

Important! If the unit is to be installed with its right-hand or left-hand side near a wall (min. of 400 mm), the base plate that is to face this way should be fitted before the unit is positioned at its final location.

3.5 To Install the Air Recirculation Section/ Louvre Damper (applies to COMPACT Heat only)

The room temperature sensor supplied with the unit must be mounted, see special instructions for the TBLZ-1-24-2 room sensor.

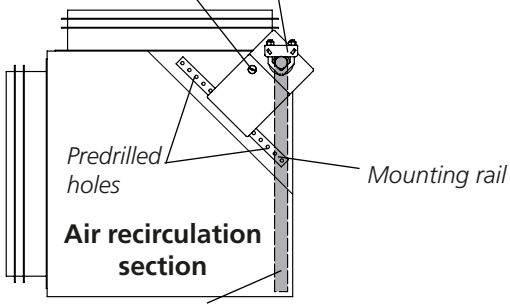
The air recirculation section and louvre damper are supplied loose.

The damper actuator for the air recirculation section is supplied resting on the extract air intake mesh on top of the unit. This part must be mounted on the air recirculation section's damper spindle as follows:

1. Remove the damper actuator from the mesh of the extract air intake. It is advisable to mount the damper actuator while the air recirculation section is at floor level before the former is mounted.
2. Disconnect the electric quick connector on the damper actuator.
3. Secure the mounting rail by means of the screws provided, in the redrilled holes on the air recirculation section. See illustration.
3. Mount the damper actuator with the damper blade in the outdoor air position, that is: the damper blade must be located against the grille. See illustration.
4. Tighten the screws holding the damper actuator with the clamp on the damper spindle. Set the actuating direction according to the direction arrow towards 0. See illustration.
5. Mount the air recirculation section on the top side of the air handling unit for outdoor air and connect the electric quick connector.
6. Fit the louvre damper on the top side of the air handling unit for exhaust air.

Clamp for the damper spindle must be in this position

Actuating direction in Position 0



Damper blade must be in the outdoor air position (grey-shaded)

3.6 Duct Connection

Connect 250 mm dia. spiral ducts to the outdoor air and exhaust air connections on the top side of the air handling unit.

Run the ducts through the external wall and have the duct end edge-to-edge with the façade of the building if Swegon's external wall hood is used.

The ducts can also be run through the ceiling (the ducts for the COMPACT Heat cannot be run straight up from the air handling unit. However this makes more complicated modifications necessary and among others places greater demands on sealing around the arrangement to achieve air tightness.

The ducts must be insulated with at least 30 mm thick insulation and be provided with a damp-proof outer layer.

Registered design. The company reserves the right to make design changes without prior notice.

3.7 Exterior Wall Hood

The CACZ-1-03 External wall hood accessory is specially designed for low pressure drop and for preventing short-circuiting between the outdoor air and the exhaust air. The standard hood is painted grey black, NCS 8502-B. See special instructions.

3.8 Existing Ventilation

The existing ventilation in the room for supply air and extract air should be blanked off or sealed. This is an important prerequisite for satisfactory ventilation and heat recovery.

3.9 Serving More than One Room

The COMPACT Air units are designed for installation and connection according the instructions in Sections 3.3, 3.6 and 3.7.

Swegon recommends this procedure.

Nevertheless it is possible to completely or partially take extract air from adjacent rooms or also to ventilate a space other than the room where the air handling unit is standing.

The problems, which one must observe in this case, are specified below. Always engage the services of a professional in this field.

3.9.1 Extract Air Intake

If the extract air is completely or partially taken from an adjacent room, note that the duct pressure drop must not exceed available pressure.

Also note that the supply air temperature is regulated in relation to the extract air temperature. If the extract air comes from another room with a different temperature, the temperature of the supply air may cause short-circuit airflows or give rise to draught problems. Pay special attention to where the extract air sensor is located.

3.9.2 Transfer Air

Transfer air grilles to adjacent rooms have a strong influence on the system's performance.

Air transfer grilles positioned low, cause the transfer of "unused" air to adjacent rooms and impair the ventilation performance in the room where the unit is installed.

Air transfer grilles positioned high involve the risk that "used" air will be transferred to adjacent rooms. Ventilation is however not impaired in the room where the unit is installed.

Important! If the doors are open, the adjacent room will also be ventilated due to the displacing air supply.

3.10 Connection to the Electric Power Grid

The COMPACT air handling unit is supplied with a power cable with mains plug, from the factory.

COMPACT Air
Cable: 3 x 1.5 mm^2. Mains plug, 10 AT, single-phase 230V.

COMPACT Heat
Cable: 5 x 2.5 mm^2. Mains plug, 5-wire Perilex, 16 AT, 3-phase 400V.

Important! The power supply connection to the COMPACT Heat unit is not of an electrical safety design that prevents children from inserting objects into the socket. It is recommended that it be positioned 2 metres above the floor above the air handling unit by the duct connections for instance.

If the air handling unit is instead to be connected with a fixed extension, an external main switch must be fitted.

3.11 To Connect External Cables

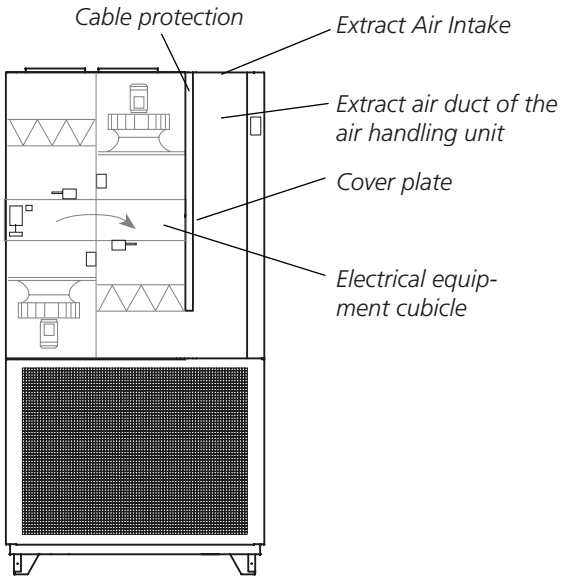
The electrical cubicle in the COMPACT Air and the COMPACT Heat units is located by the heat exchanger. When access to the control unit is required, the safety guard in front of the heat exchanger must first be dismantled. When access to the power unit is required, the cover plate in the unit's extract air duct must first be dismantled.

Cables from external sources can be run into the air handling unit through the rubber diaphragm by the extract air intake, located on the top of the unit.

The external cables can be extended in the existing cable protection together with the power supply cable in the extract air duct of the unit. Insert the cable in the opening in the end of the cable protection or press it in between the cable protection and the insulation.

Cables can be run in to the electric cubicle according to appropriate hole instructions in the rubber diaphragm.

N.B.! Cables for external communication outside the air handling unit must be arranged at a minimum distance of 100 mm from any current-carrying (live) cable.



3.12 To Adjust the Supply Air Discs

The positions of the supply air discs can be adjusted after dismantling the front grille of the lower section of the unit. Use a 6 mm Allen key. The screws are located within the outer holes in the corners.

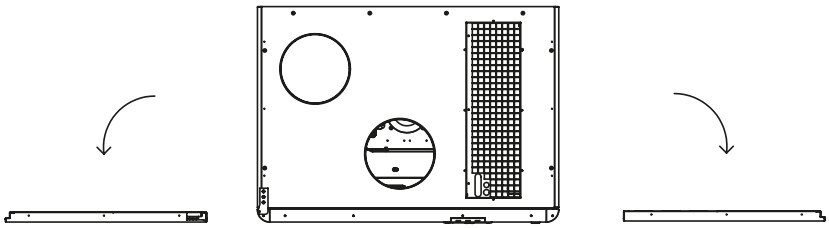
When the front grille has been removed, the air discharge direction of the front discs can be adjusted from the backside of the front grille. Turn the discs by hand to the appropriate setting.

The side discs can now also be adjusted without any further dismantling. The discs are accessible by putting your hand inside the air handling unit.

The factory-preset supply air distribution pattern and two examples of possible modified distribution patterns are shown below.

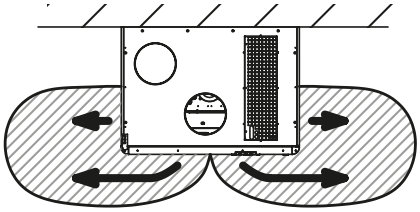
Since each disc is individually adjustable, the possibilities for modifying the air distribution pattern are practically endless.

Air handling unit viewed from above.

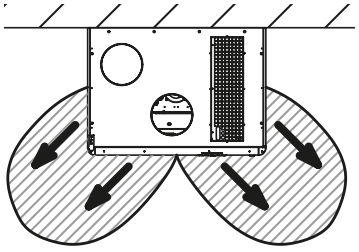


The front discs and side discs are shown from this view below.

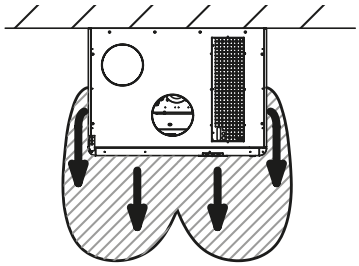
Distribution pattern



Discs in factory-preset position

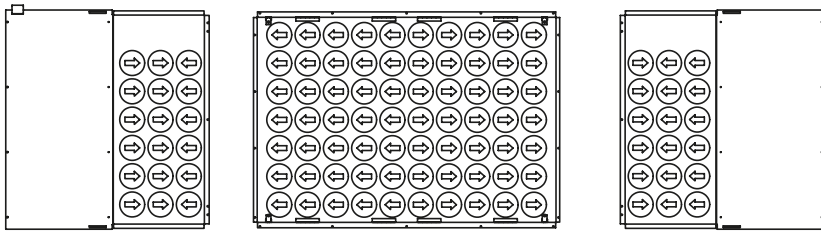


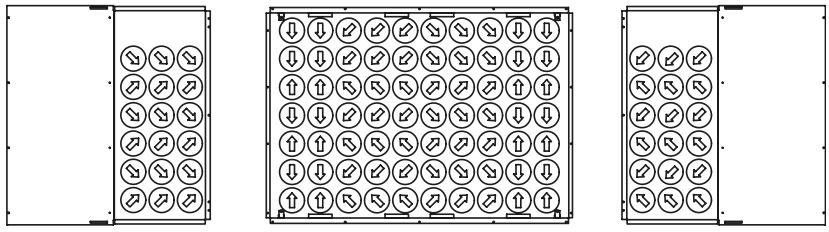
Example 1

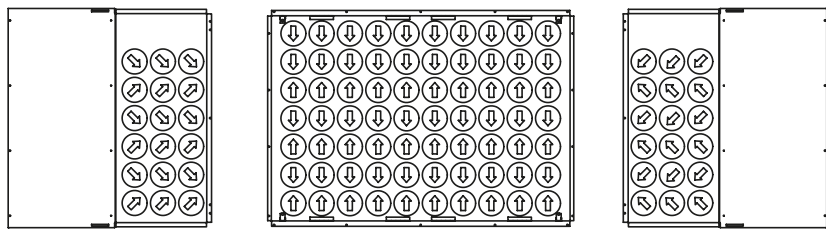


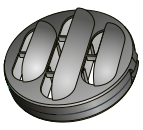
Example 2

Front discs and side discs









The arrows shown above indicate the position of each disc.

Registered design. The company reserves the right to make design changes without prior notice.

4 COMMISSIONING

4.1 General

Commissioning sequence:

1. Check that there are no foreign objects inside the unit, duct system or functional sections.

   COMPACT Heat: air recirculation section, louvre damper and room temperature sensor shall be installed, see Section 3.5.

2. Connect the mains plug. Note that the air handling unit starts up immediately and operates in the normal mode.
3. Select the appropriate language, if you have not already done so. See Section 15.1.
4. The air handling unit has a factory setting that makes it ready to operate. See Section 22.2 Commissioning Record.

   However, in many cases, these settings need to be adjusted to suit the current installation.

   Program the timer (switch clock), operating mode, temperatures, airflows and functions according to the procedures in Sections 6-17.

   Select whether the airflow unit of measurement shall be l/s, m^3/s or m^3/h. (INSTALLATION LEVEL in the CONTROL DISPLAY menu).

   Fill out the Commissioning Record and save it in the document pocket of the air handling unit.

5. Activate, if needed, manual or auto operation (MAIN MENU 2) or lock the speed of the fans (AIR ADJUSTMENT menu).
6. Finish off with a filter calibration as described in Section 6.4.2.

5 CONTROL DISPLAY AND USING THE MENU

5.1 Control display

5.1.1 General:

The control display has an illuminated display, 6 pushbuttons and a red LED for indicating alarms.

5.1.2 The Buttons

The buttons have the following functions:

ENTER confirms your selection of the highlighted function and proceeds to next deeper menu level.

ESCAPE changes the display back to the previous menu. For menus with REMAIN.TIME display, the image changes automatically back to the previous menu after approx. 10 seconds.

ADVANCE UPWARD or to the LEFT.

ADVANCE DOWNWARD or to the RIGHT.

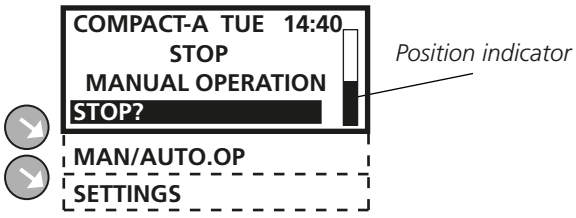
DECREASES the value of the highlighted setting. Changes are registered immediately and need not be confirmed by pressing Enter.

INCREASES the value of the highlighted setting. Changes are registered immediately and need not be confirmed by pressing Enter.

The control display is mounted on the inspection door of the air handling unit.

5.1.3 Display screen

The display screen has 4 lines. Many of the menus however have more lines and these are shown line for line as you press the ADVANCE DOWNWARD button. The position indicator shows where you are in the menu.



5.1.4 Abbreviations Used

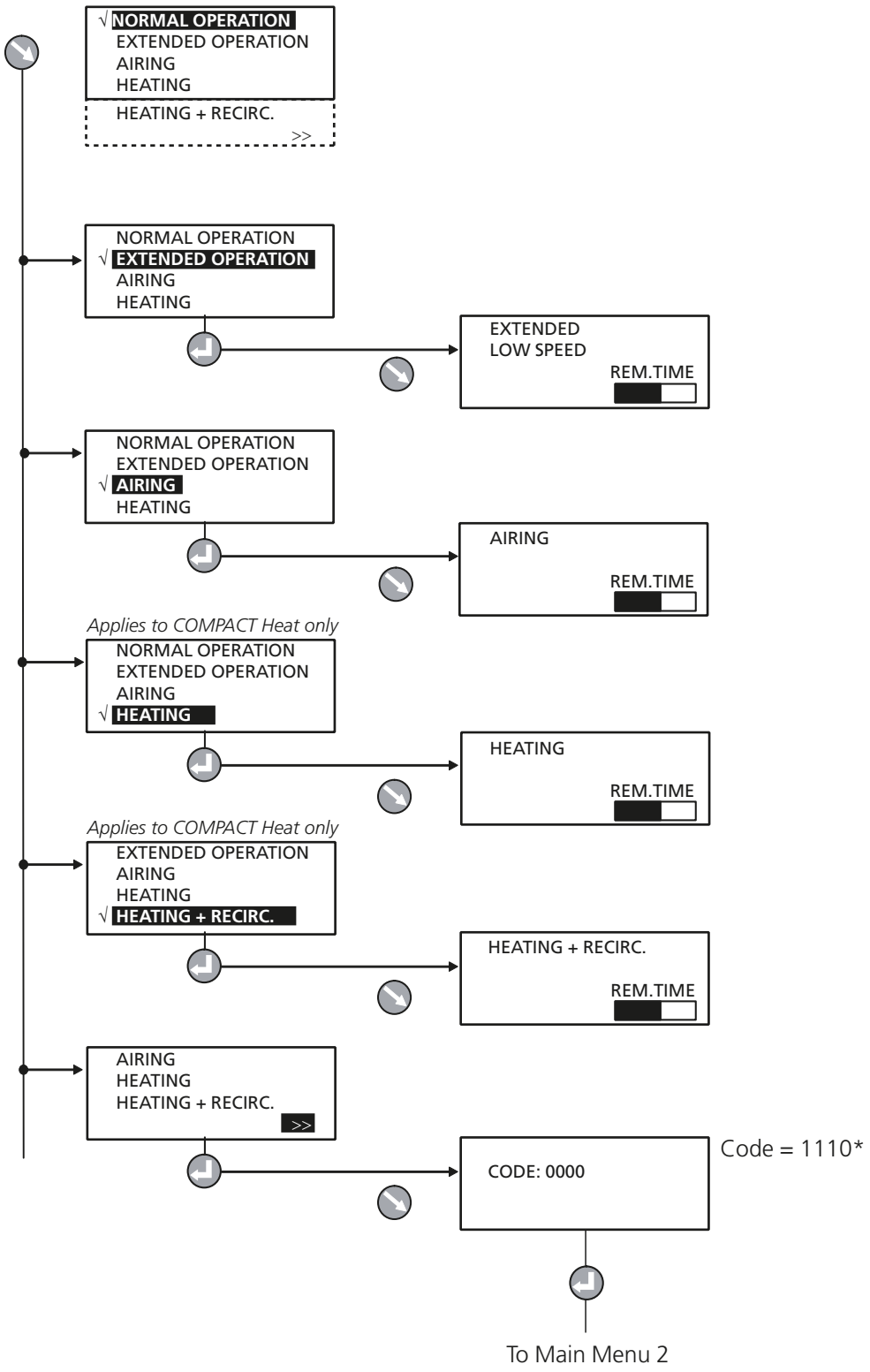
The following abbreviations are generally used in the menus:

SA = Supply air (Ex: SA FAN = Supply air fan)
EA = Extract air
OUTD = Outdoor air
ROOM = Room
ANTI-FROST MON = Anti-frosting monitor
HEAT EXCH = Heat exchanger

Registered design. The company reserves the right to make design changes without prior notice.

6 MAIN MENU 1

6.1 The Menu Tree



** The code can be changed under Service Level.*

6.2 General

The main menu is normally shown if no other menu has been selected.

The display automatically returns to the main menu after 30 minutes.

The content in the menu changes depending on the operating mode selected, other functions that affect the present operating mode and possible tripped alarms.

6.3 Selection of Language

When the air handling unit is started up for the first time, a language selection menu is displayed. Select the appropriate language.

If you want to change language at a later opportunity – or if you've selected the wrong language – you can change the language at INSTALLATION LEVEL under CONTROL DISPLAY. See Section 15.1.

6.4 Normal Operation

NORMAL OPERATION is highlighted in the display when the air handling unit is operated in the selected operating mode under Main Menu 2. Alternatives to operation are: stop (appears alternately in the menu when selected), auto operation, manual low speed or manual high speed operation, see Section 7.2.

The type of operation selected can be checked under Main Menu 2.

Normal operation indicates that the air handling unit is not being operated in any of the time-limited manually activated functions. See Sections 6.5, 6.6, 6.7 and 6.8.

6.5 Extended operation

When EXTENDED OPERATION has been activated, the unit operates in the high speed airflow mode preset under User Level, see Section 8.2.

For particulars of the times for extended operation, see Section 10.5.2.

The function can be cancelled by pressing the escape button on the control display and then selecting Normal Operation.

6.6 Airing

When AIRING is activated, the unit operates in the max speed airflow mode preset under User Level, see Section 8.2.

For particulars on how to set the appropriate supply air temperature and period for airing, see Section 10.2.2.

The function can be cancelled by pressing the escape button on the control display and then selecting Normal Operation.

6.7 Heating (applies to COMPACT Heat only)

The COMPACT Heat can be used for heating the room.

When HEATING is activated, the electric air heater (7.5 kW) heats up the air. A change-over damper in the lower section of the air handling unit is reset and the air is led to the air discharge outlets at the bottom of the unit. The air is discharged at high velocity and follows the floor surface by means of the so-called coanda effect. This enables long throw lengths and quickly heats the entire premises.

The function can also be manually selected under HEATING. The air handling unit then operates According to the preset conditions and times, see Section 10.2.6.

The function can be cancelled by pressing the escape button on the control display and then selecting Normal Operation.

6.8 Heating + Recirculation (applies to COMPACT Heat only)

The COMPACT Heat can be used for heating the room.

When the HEATING + RECIRC. function is activated, the extract air fan and the heat exchanger are switched off. The damper in the air recirculation section is reset and room air is circulated. The louvre damper for exhaust air closes to prevent any cold down draught.

The electric air heater (7.5 kW) heats up the air. A change-over damper in the lower section of the air handling unit is reset and the air is led to the air discharge outlets at the bottom of the unit. The air is discharged at high velocity and follows the floor surface by means of the so-called coanda effect. This enables long throw lengths and quickly heats the entire premises.

When HEATING + RECIRC. is activated the air handling unit operates according to the preset conditions and times, see Section 10.2.6.

The function can be cancelled by pressing the escape button on the control display and then selecting Normal Operation.

6.9 Main Menu 2

You can access to Main Menu 2 by highlighting >> the line farthest down and acknowledge by pressing the Enter button.

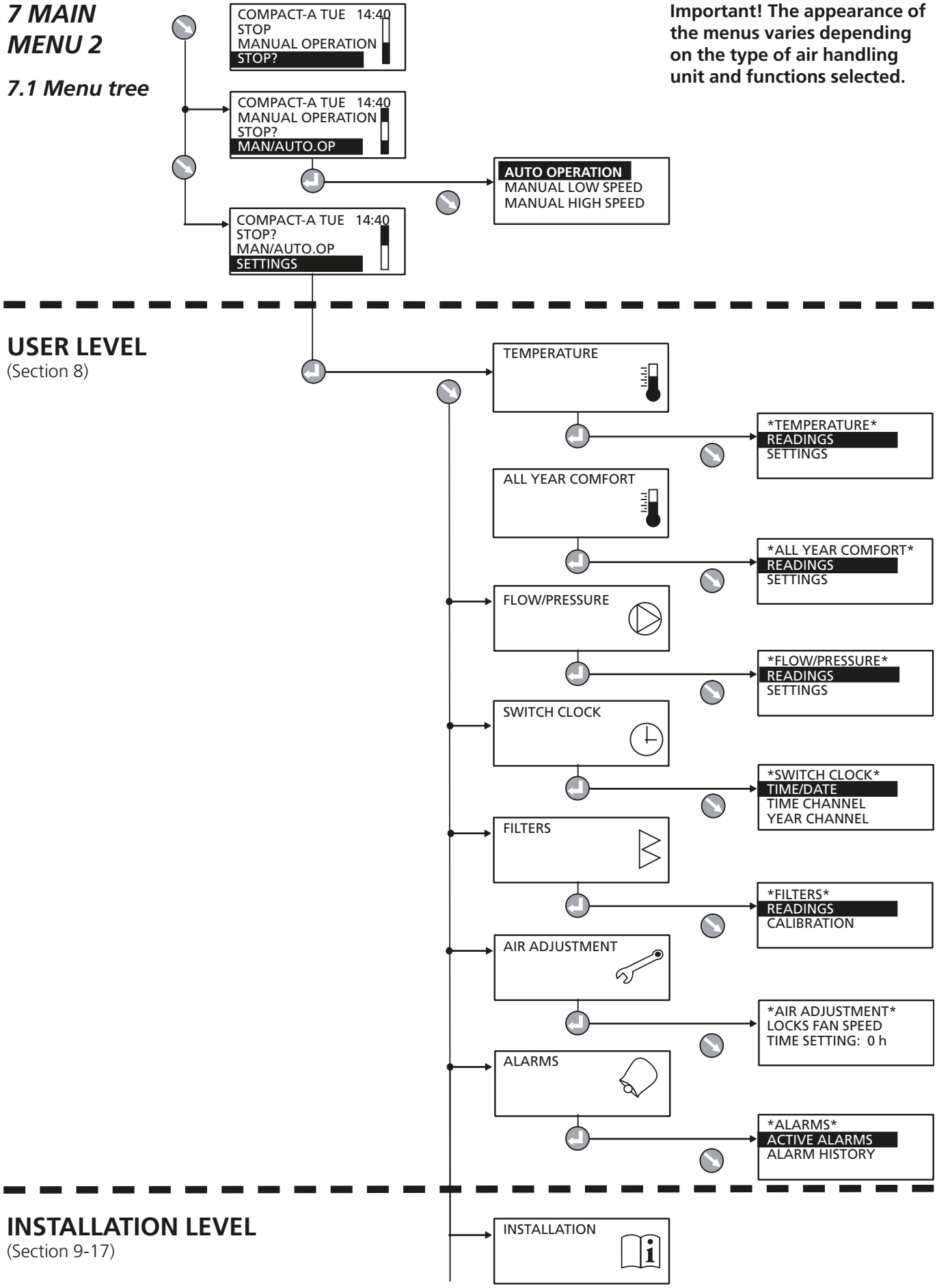
Enter the code. (Factory-preset code: 1110) The code can be changed under Service Level.

Registered design. The company reserves the right to make design changes without prior notice.

7 MAIN MENU 2

7.1 Menu tree

Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.



7.2 Changing Operating Mode

You can start and stop the air handling unit or change over to manual or automatic operation from the main menu.

⚠ The air handling unit should normally be started and stopped from the hand-held micro terminal; not by switching the safety isolating switch on and off.

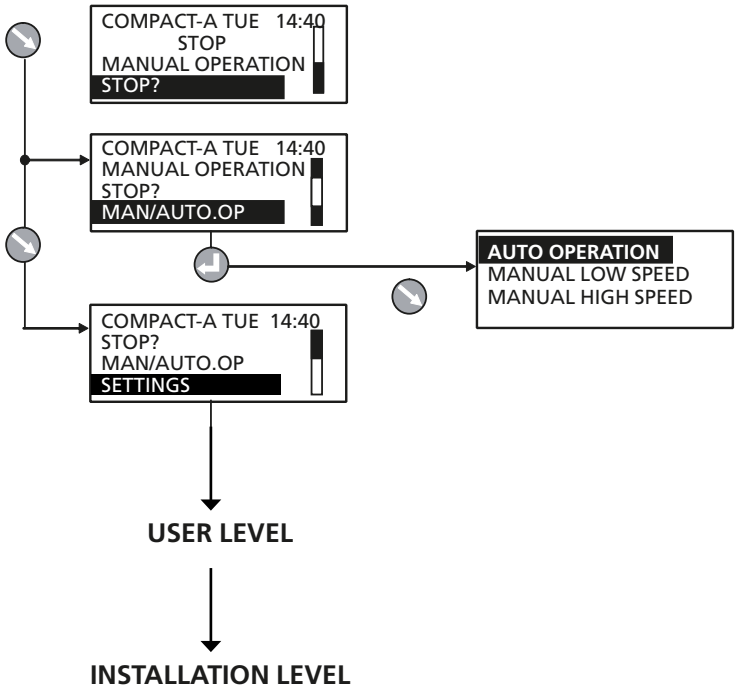
When the air handling unit is started up, menus for the various delays that are part of the starting sequence are shown.

See also Section 11.1.1, Starting Sequence.

7.3 Settings

When selecting SETTINGS in the main menu, you will advance to User Level and Installation Level.

See Section 8.



Registered design. The company reserves the right to make design changes without prior notice.

8 USER LEVEL

8.1 Temperature

The basic functions can be preset at INSTALLATION LEVEL and the values can be read and set at USER LEVEL. **See also Section 10.2 in which the functions for temperature are described in detail.**

IMPORTANT! If you intend to substantially alter the temperature settings, you should first stop the air handling unit before doing so.

8.1.1 Readings

Used for checking the performance.

8.1.2 Settings

ERS REGULATION 1
The control unit regulates the relationship between the supply air and the extract air temperatures according to a factory preset curve.

Settings *(see the chart to the right as well):*

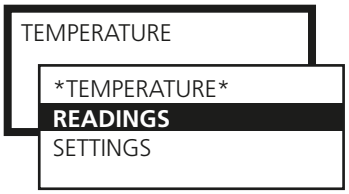
Value	Setting range	Factory settings
Step	1 - 3	1
EA/SA Differential	1-5 °C*	2 °C
Breakpoint (refers to extract air temperature)	15-23 °C*	20 °C

**) The setting range can be changed. See Section 15.3, Min./ Max. Setting.*

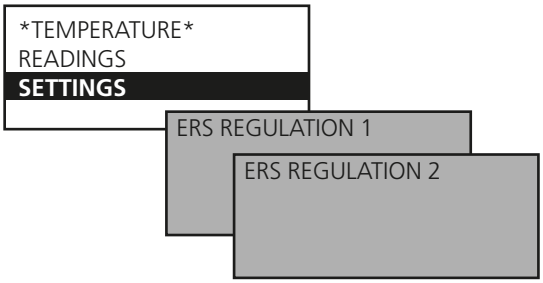
ERS REGULATION 2
The control unit regulates the relationship between the supply air and extract air temperatures according to a custom-plotted curve. The curve has three adjustable breakpoints.

Settings *(see the chart to the right as well):*

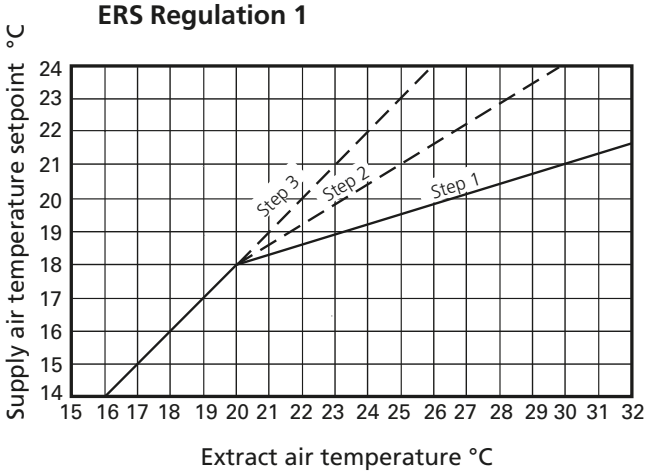
Value	Setting range	Factory settings
Extract air temperature		
X1	10-40 °C	15 °C
X2	10-40 °C	20 °C
X3	10-40 °C	22 °C
Supply air temperature		
Y1	10-40 °C	20 °C
Y2	10-40 °C	18 °C
Y3	10-40 °C	14 °C



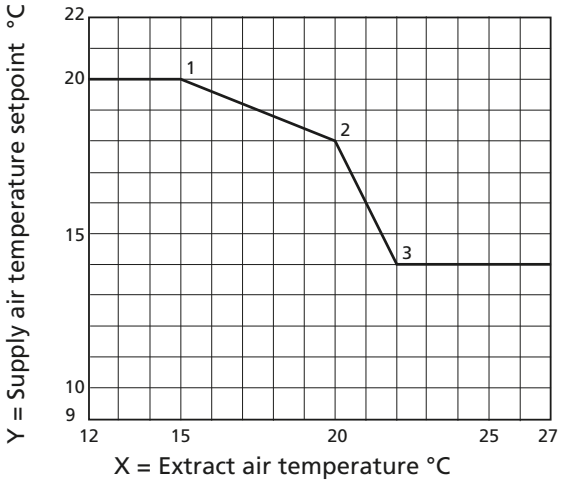
Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.



ERS Regulation 1



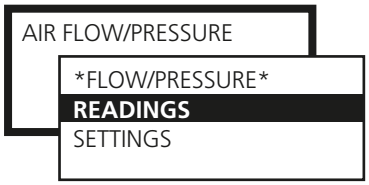
ERS Regulation 2



8.2 Air flow/Pressure

Basic functions are set at INSTALLATION LEVEL and values are read and set at USER LEVEL.

Therefore see also Section 10.3, in which the functions for flow/pressure are described in detail.



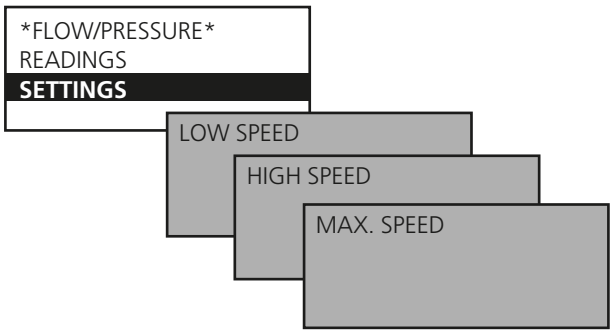
8.2.1 Readings

Used for performance checks.

8.2.2 Settings

The functions selected at INSTALLATION LEVEL and the min. and max. airflows of each unit size (see the table below) determine which values can be set.

Values for airflow (l/s, m3/s, m3/h), pressure (Pa) or input signal strength (%) can be preset depending on the function selected.



LOW SPEED
Must always be preset! The value for low fan speed cannot be higher than the value for high speed.

Low speed can be set as 0, which means that the air handling unit stops.

HIGH SPEED
Must always be preset! The value for high speed cannot be lower than the value for low speed.

MAX SPEED
Is only appropriate for the airing function. The value for max speed cannot be lower than the value for high speed.

Min/Max Airflows

AIRFLOW SIZE	MIN FLOW COMPACT AIR AND COMPACT HEAT		MAX FLOW COMPACT AIR AND COMPACT HEAT	
	m^3/h *	m^3/s	m^3/h	m^3/s
02	300	0.08	800	0.23
03	300	0.08	1300	0.36

* When you adjust the value, round off the value to the nearest adjustable step.

Registered design. The company reserves the right to make design changes without prior notice.

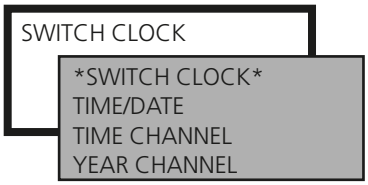
8.3 Switch clock

Basic functions for the switch clock can be preset at INSTALLATION LEVEL under FUNCTIONS/OPERATION and the values can be read and set at USER LEVEL.

TIME/DATE
The current date and time can be set and adjusted whenever required.
The switch clock automatically takes leap years into consideration.
Automatic changeover between summer time/winter time to EU Standard has been preset.
This changeover function can be blocked at INSTALLATION LEVEL under FUNCTIONS/OPERATION.

TIME CHANNEL
Times and days can be set when the unit is to run at high speed, low speed or be stopped.
Eight different time channels can be set. If the same in-operation times are to apply every day of the week (Mon-Sun), you need only program one time channel. Different operation times for each day of the week can be programmed by programming a time channel for each day (Mon-Fri, Sat-Sun or Mon, Tues, Wed, etc)
The time can be set as 00:00-00:00 if the deviating in-operation period is desirable for the entire 24 hours period.

YEAR CHANNEL
The year channels make it possible to set deviating in-service times for parts of the day during certain parts of the year. Eight different year channels (yearly time schedules) can be set. The year channels over-modulate the time channel during the hours of the day and the days that the year channel is active. The year channel dates indicate the dates between which the year channel shall apply and the year channel hours indicate the hours of the day between which the year channel will steer the controller to operate the rotary heat exchanger at a specified speed. Other times within the year channel still apply to that time channel.
The time can be set as 00:00-00:00 if the deviating in-operation period is desirable for the entire 24 hours period.
Functions for summer night cooling, prolonged operation, etc., operate also when the year channel is active.



Settings:

Value	Setting range	Factory setting
TIME/DATE		
Day	Mon-Sun	Automatic
Time	00:00-23:59	Current
Date	Day/Month/Year	Current
TIME CHANNEL 1-8		
Operation	Low speed/High speed*	High speed
Time	00:00-23:59	00:00-00:00
Period	Not active	Not active
	Mon, Tues, Wed etc	
	Mon-Fri	
	Mon-Sun	
	Sat-Sun	
YEAR CHANNEL 1-8		
Operation	Not active	Not active
	Stop/Low sp./High sp.	
Time	00:00-23:59	00:00-00:00
Period	From Day/Month/Year	01/01/2005
	To Day/Month/Year	01/01/2005

*) Shows Stop/Low speed/High speed if this function is selected at INSTALLATION LEVEL under FUNCTIONS/OPERATION.

8.4 Filters

(and anti-frosting function of rotary heat exchanger)

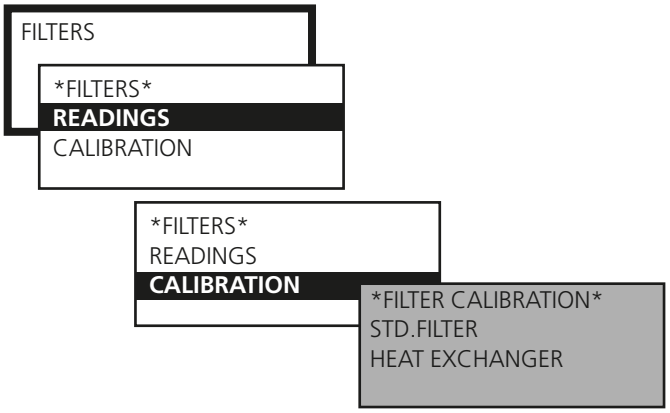
There are two types of filter monitoring:
Calculated filter monitoring (preset at factory) monitors the fan's speed increase conditional on the degree of fouling in the filter. The calibration involves taking airflow and fan speed readings. An alarm is initiated when the fan speed has increased by 10% above the preset alarm limit.
Filter monitoring with a pressure sensor (accessory) measures the pressure drop across the filter. The alarm limit is preset in Pa.

8.4.1 Readings

When reading the filter status, the first value shows current value and the second value shows current alarm limit.

8.4.2 To Calibrate the Filters

The filters must be calibrated for the first time during commissioning, when the duct system has been installed and adjusted. After that every time filters are replaced.



Calibration should be activated for both the supply air and the extract air if both filters are changed or for only for one airflow direction if only one filter has been changed.
When filter calibration has been activated, the unit runs at high speed for about 3 minutes.
After the filter has been calibrated, a speed increase of 10%, or a pressure rise (= fouling of the filters) of 100 Pa is permissible, after which an alarm is initiated indicating a fouled filter.
The alarm limit can be changed at INSTALLATION LEVEL under ALARM SETTINGS.

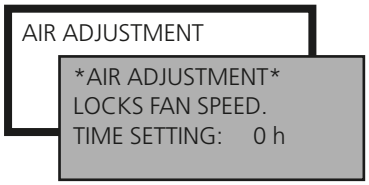
8.4.3 Calibration - Rotary Heat Exchanger

If the anti-frosting function accessory for heat exchanger is installed (see 10.6.1.1) calibration can be selected from this menu. When calibration R-HX is activated the fans are accelerated to high speed for about 3 minutes.

8.5 Air Adjustment

The speed of the fans can be locked for up to 72 hours. This is practical in conjunction with adjusting the airflow in the duct system.

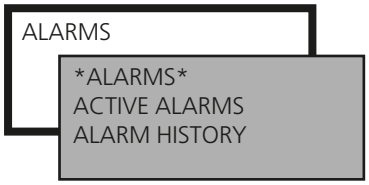
The period desired is preset but can be interrupted earlier by selecting STOP in the menu or by changing the time setting to 0.



8.6 Alarms

If an alarm is initiated, this is shown in the hand-held terminal both as clear text and by a blinking red diode.

This menu enables you to read alarms quickly.



ACTIVE ALARMS
Shows alarms that are active but have not initiated an alarm signal in the display. This applies to alarms that have a long delay, i.e. airflow or temperature alarms.

ALARM HISTORY
The 10 most recent tripped alarms are shown.

⚠ Alarm settings can be entered at INSTALLATION LEVEL under ALARM SETTINGS.

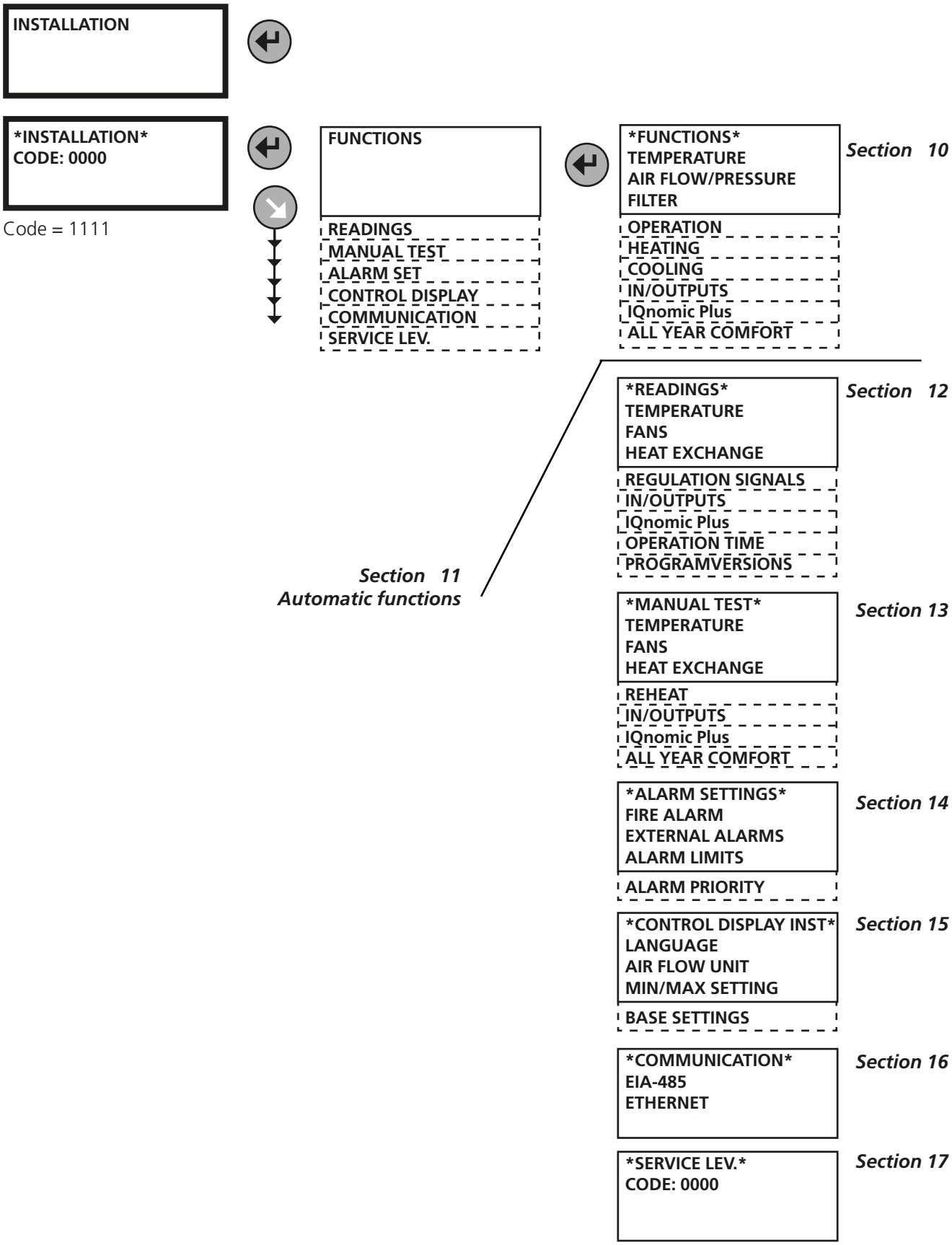
For complete description of alarms, see Section 19.

Registered design. The company reserves the right to make design changes without prior notice.

9 INSTALLATION LEVEL

Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.

9.1 Menu Survey



10 FUNCTIONS

10.1 Temperature

Basic functions can be set at INSTALLATION LEVEL and values are read and set at USER LEVEL.

IMPORTANT! If you intend to substantially alter the temperature settings, you should first stop the air handling unit before doing so.

10.2 Temperature Regulation (Control)

Select ERS Regulation. Then select ERS Regulation 1 or 2.

Control sequence for ERS regulation:

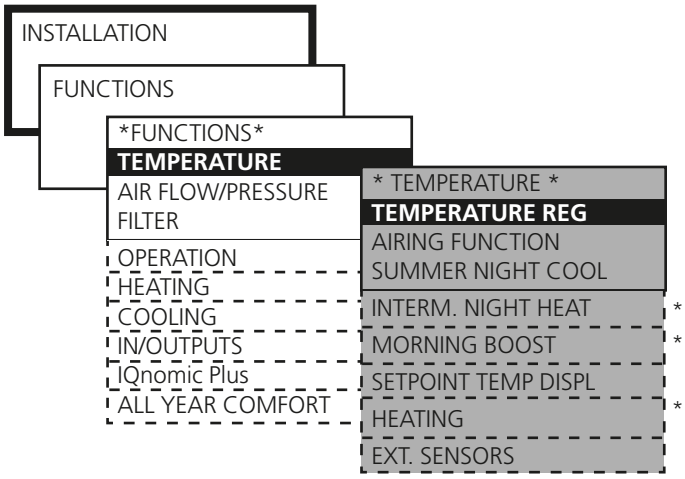
1. The temperature efficiency of the air handling unit's heat exchanger is modulated to provide max. heat recovery.
2. After that the air heater, if installed, will begin to generate heat.
3. If a downstream heating coil is not installed, or if the its output is not adequate, the supply air fan will be automatically and variably downspeed-regulated to convey air at a lower flow rate.

A neutral zone can be preset, which allows a lower supply air temperature setpoint before regulation to a lower flow rate begins. See 10.3.3.

When the supply airflow is regulated to a lower rate, the heat exchanger will have "excess heat", i.e. warm extract air, giving it capacity to maintain the supply air temperature required.

As the supply airflow is regulated to a lower rate, the air pressure in the premises will become negative and this will instead cause outdoor air to be sucked in through leakage spots such as doors and windows. This outdoor air will then be heated by the usual heating system of the premises.

Downspeed regulation to lower the airflow rate occurs from the current preset flow (high speed or low speed), down to half of this flow rate. The degree of regulation to a lower rate is also limited by the min flow setting of the unit. When preset flow for low speed is near the min flow rate, the effect of this regulation to a lower rate will be small.



** Applies to COMPACT Heat only*

Important! The appearance of the menus varies depending on the type of air handling unit and functions selected.

Registered design. The company reserves the right to make design changes without prior notice.

10.2.1.1 ERS Regulation

ERS regulation means Extract air temperature-Related Supply air temperature regulation. This means that the temperature of the supply air is regulated in relation to the temperature of the extract air. Under normal circumstances, the supply air temperature is regulated to be a few degrees lower than the extract air temperature. In this way, the heat exchanger will provide optimal performance, and this means excellent operating economy. ERS regulation is suitable for use when there is excess heat in the premises generated, for example, by machinery, lighting or people and the supply air devices in the premises are suitable for diffusing air below room temperature.

ERS REGULATION 1

The control unit regulates the relationship between the supply air and extract air temperatures according to a factory-preset curve.

See the chart to the right.

The steps, breakpoint and EA/SA differential plotted in the curve can be changed at USER LEVEL under TEMPERATURE/SETTINGS.

Settings:

Value	Setting range	Factory setting
Step	1 – 3	1
Breakpoint (refers to extract air temp.)	15-23 °C	20 °C
EA/SA-Differential	1-5 °C	2 °C

The setting range for the Break Point and EA/SA difference is limited by Min. and Max. settings at *INSTALLATION LEVEL under CONTROL DISPLAY*.

ERS REGULATION 2

This is used when special needs and conditions are such that the factory preset ERS regulation 1 curve cannot provide the results required. Conditional on which settings are made, it may be necessary to install a post-heating coil.

An individually adapted curve regulates the relationship between the supply air and extract air temperature.

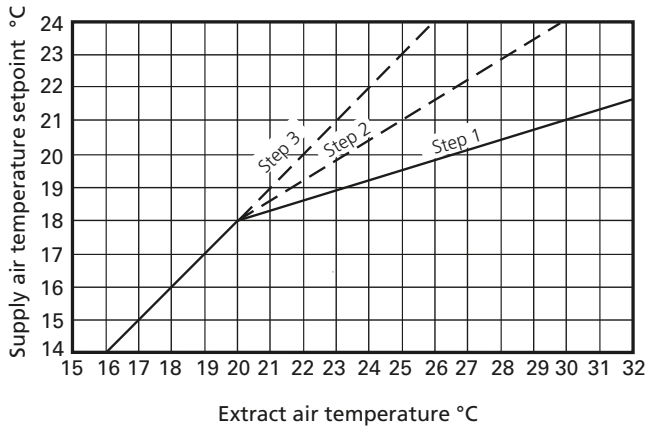
See the chart to the right.

The following settings are possible at USER LEVEL under TEMPERATURE/SETTINGS:

Value	Setting range	Factory setting
Extract air temperature		
	X1 10-38 °C	15 °C
	X2 11-39 °C	20 °C
	X3 12-40 °C	22 °C
Supply air temperature setpoint		
	Y1 10-40 °C	20 °C
	Y2 10-40 °C	18 °C
	Y3 10-40 °C	14 °C

The setpoint displacement and summer night cooling functions can also affect the preset temperatures.

ERS regulation 1

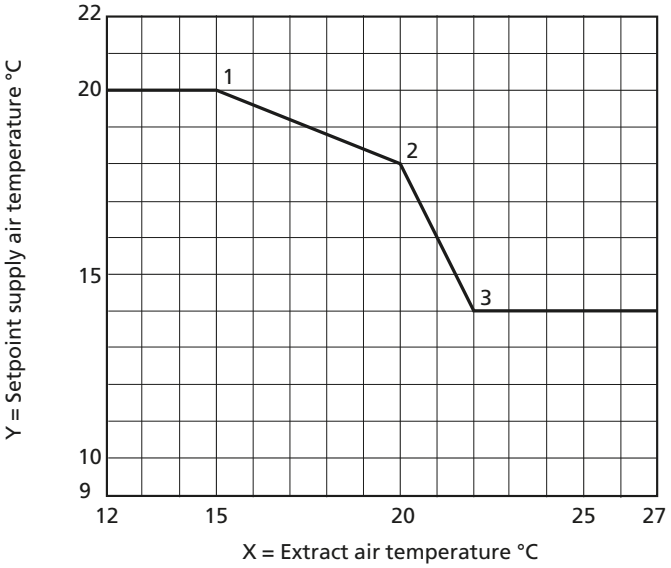


Factory setting means:

If the extract air temperature is below 20 °C (breakpoint), the supply air temperature setpoint will be automatically regulated to be 2 °C (EA/SA differential) lower.

If the extract air temperature is above 20 °C, the supply air temperature setpoint will follow the curve according to Step 1.

ERS regulation 2



Breakpoints according to factory setting means:

If the extract air temperature is below 15 °C (X1) the setpoint for supply air temperature is constant 20 °C (Y1).

If the extract air temperature is 20 °C (X2) the supply air temperature set point will be 18 °C (Y2).

If the extract air temperature is above 22 °C (X3), the supply air temperature setpoint will be constantly 14 °C (Y3).

10.2.2 Airing Function

The airing function means that the air handling unit will operate in the max. speed mode and temperature during the preset period.

The function requires either a presence detector or has to be manually activated in Main Menu 1.

10.2.2.1 Automatic Airing

The presence detector shall be connected to the external input, selected for external high speed.

Conditions that must be met for automatic airing to start:

- Presence of occupant(s) has been indicated during at least 10 minutes.
- Occupant(s) are no longer present and the preset time period for high speed airflow has expired.

Conditions that must be met for automatic airing to stop:

- Airing has taken place during the preset time period.
- The presence of occupant(s) is indicated via input for externally actuated high speed airflow.

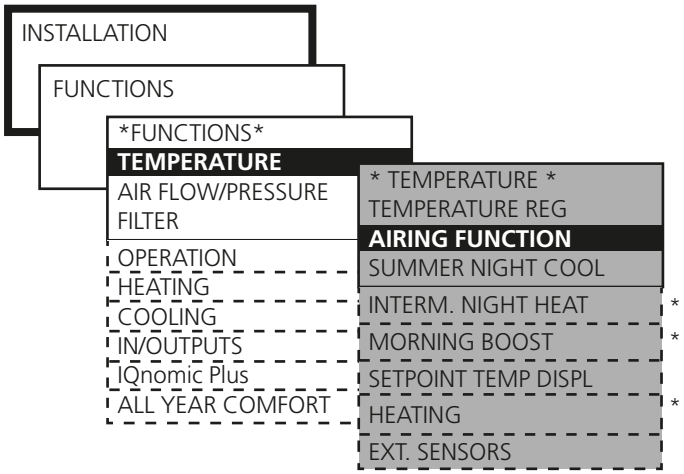
10.2.2.2 Manual Airing

The Airing function can be started from Main Menu 1 and will then operate during the preset time period.

The Airing function can be manually cancelled by setting the air handling unit to Normal Operation in the control display.

Settings:

Value ting	Setting range	Factory set-
Function, Off/On	Inactive/Active	Inactive
Supply air temperature	10 - 20 °C	10 °C
Time period	10-60 min.	15 min.



** Applies to COMPACT Heat only*

Registered design. The company reserves the right to make design changes without prior notice.

10.2.3 Summer Night Cooling

The lower temperature at night is utilized to cool down the building structure. This reduces the cooling load during the first hours of the day. If a cooling unit is installed, its in-operation hours will be minimized, thus offering savings. If no cooling unit is installed, a certain cooling effect will still be realized.

When summer night cooling function is activated, the unit fans operate at high speed, with a supply air setpoint of 10°C, from the preset time until the conditions necessary for stop are satisfied.

Conditions to be met to start summer night cooling at the preset time:

• The extract air temperature should be higher than the preset value

• The extract air should be at least 2°C warmer than the outdoor air.

• The outdoor temperature should be above the preset value.

• Heating has not been required between 12.00–23.00 hours.

• The unit must not operate in the high speed mode or be stopped from an external source or manually from the control display.

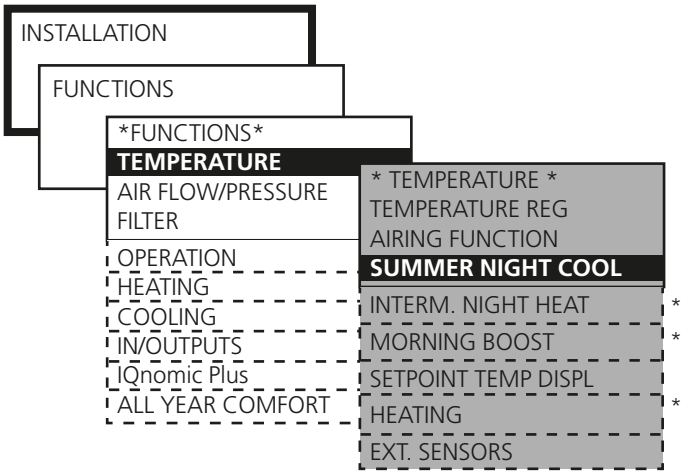
Conditions to be met to stop summer night cooling at the preset time:

• The extract air temperature drops below the preset value.

• The outdoor temperature drops below the preset value.

• Switch clock or external input calls for high speed.

• The extract air is less than 1 °C warmer than the outdoor air.



** Applies to COMPACT Heat only*

The function starts once per set time period.

Settings:

Value	Setting range	Factory setting
Extract air temperature for start	17 - 27 °C	22 °C
Extract air temperature for stop	12 - 22 °C	16 °C
Outdoor temperature for stop	5 - 15 °C	10 °C
Supply air setpoint	10 - 20 °C	10 °C
Operating period	00:00-00:00	23:00-06:00

10.2.4 Intermittent Night-time Heating (applies to COMPACT Heat only)

The unit is utilized to heat the premises when it is normally stopped by the switch clock.

The function requires connection of an external room sensor. Connect the TBLZ-1-24-2 Room sensor by means of the modular cable supplied, to an optional connection marked Internal BUS 1.

When the function is activated, the air handling unit detects when the room temperature drops below the preset start temperature. The unit starts with preset flows and the supply air temperature setpoint.

If extract air fan operation is not desirable, the extract airflow can be set to 0.

The damper output can be set to be Inactive. This means that the connected dampers (such as shut-off dampers for outdoor air and extract air) will not be affected. These dampers are normally closed when the air handling unit is stopped and they also remain closed. The damper in the air recirculation section opens at the same time.

Intermittent night-time heating does not affect a possible extra temperature zone (Xzone) that regulates according to its ordinary set point, if intermittent night-time heating is in operation.

Conditions to be met for intermittent night-time heating to start:

• The unit should operate in a time channel/switch clock stop.

• The room temperature should be below set start temperature.

Conditions to be met for intermittent night-time heating to stop:

• High speed or external/manual stop should be activated.

• Room temperature should be above the preset stop temperature.

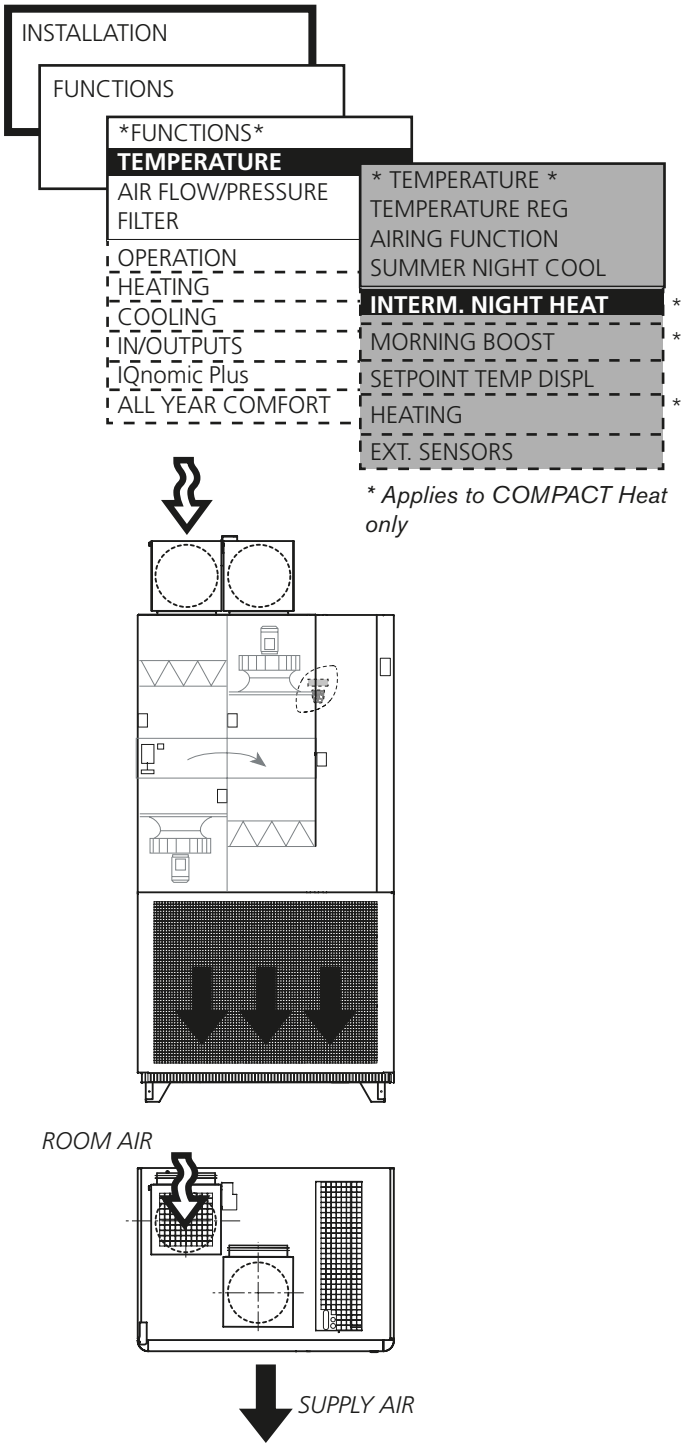
• Alarm with preset stop priority has tripped.

If the needed, the air handling unit fans will continue to operate to cool the electric air heater although other conditions for stop have been met.)

Settings:

Value	Setting range	Factory setting
Room temperature for start	5 - 25 °C	16 °C
Room temperature for stop	5 - 25 °C	18 °C
Supply air temperature setpoint	10 - 40 °C	28 °C
Supply airflow	*) m3/s/Pa	**) m3/s/Pa
Extract airflow	*) m3/s/Pa	0 m3/s/Pa
Damper output	Inactive/Active	Inactive

*) The setting range is the same as the min/max settings of the air handling unit.
**) According to the setting for low speed at USER LEVEL under FLOW/PRESSURE.



Intermittent night-time heating with air recirculation section:

If the extract airflow is set to 0 and the output to the damper is inactive, the following will take place:

When conditions for start are met, outdoor air and exhaust air shut-off dampers remain closed. The damper in the air recirculation section is opened. The extract air fan is idle.

The supply air fan operates according to the preset supply airflow and the heating coil downstream of the air handling unit operates according to the supply air temperature setpoint, until the conditions for stop are met.

Registered design. The company reserves the right to make design changes without prior notice.

10.2.5 Morning BOOST (applies to COMPACT Heat only)

The unit is utilised to heat the premises during a preset period prior to the switch-in time set on the switch clock.

The unit starts early and uses the separate settings for operation and temperature regulation.

The preset time is the time difference between the start of Morning BOOST to the start of ordinary operation.

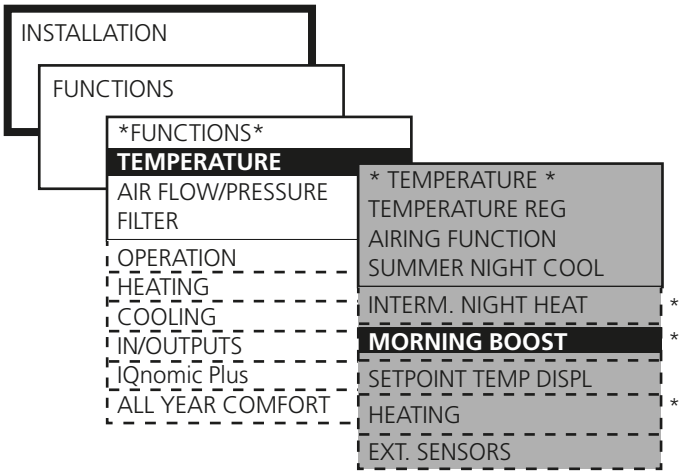
Damper output can be set to be inactive. This means that connected dampers (e.g. outdoor air and exhaust air shut-off dampers) are not affected. Normally these dampers are closed when the unit is stopped and thus they remain closed. The damper in the air recirculation section opens at the same time.

The extract airflow can be set to Inactive if it is not desirable for the extract air fan to operate.

Settings:

Value	Setting range	Factory setting
Time for start prior to regular start time according to switch clock 00:00		hour, min.
Damper output	Inactive	Inactive
Extract air fan	Inactive	Inactive
EA/Room temp*	10 - 30 °C	22 °C
SA-min*	8 - 20 °C	15 °C
SA-max*	16 - 50 °C	28 °C

** If these values are changed, the corresponding values under Heating will also change.*



** Applies to COMPACT Heat only*

10.2.6 Setpoint Temperature Displacement

Used for changing the supply air and extract air temperature setpoints by means of an external 0-10 VDC signal (control unit terminals 35 (-), 37 (+)). The temperature can be increased or decreased at certain times of the day by means of an external switch clock or potentiometer, for instance.

The setpoint can be influenced ±5 °C.

If the unit is operating in the supply air regulation mode, the supply air temperature is displaced and if the unit is operating in the extract air regulation mode, the extract air temperature is displaced.

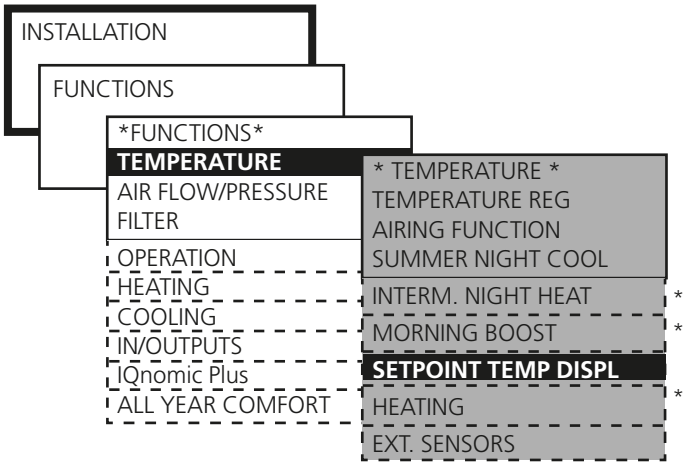
When the unit is operating in the ERS regulation 1 mode, the difference between extract air and supply air is influenced. The difference cannot be less than 0 °C. The difference will decrease as the input signal increases.

If the unit is operating in the ERS regulation 2 mode, the supply air setpoint will be offset.

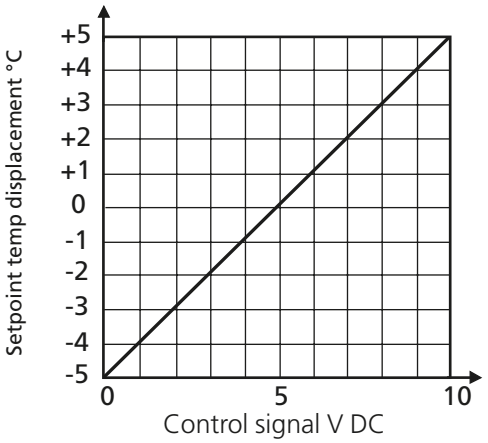
When the function is activated, the setpoint is offset as illustrated in the chart to the right.

Settings:

Value	Setting range	Factory setting
Setpoint temp displacement	Inactive/active	Inactive



** Applies to COMPACT Heat only*



Setpoint temp displacement involves:
Control signal 0 V DC: The setpoint is lowered by 5 °C.
Control signal 5 V DC: Unchanged setpoint.
Control signal 10 V DC: The setpoint is increased by 5 °C.

10.2.7 Heating (applies to COMPACT Heat only)

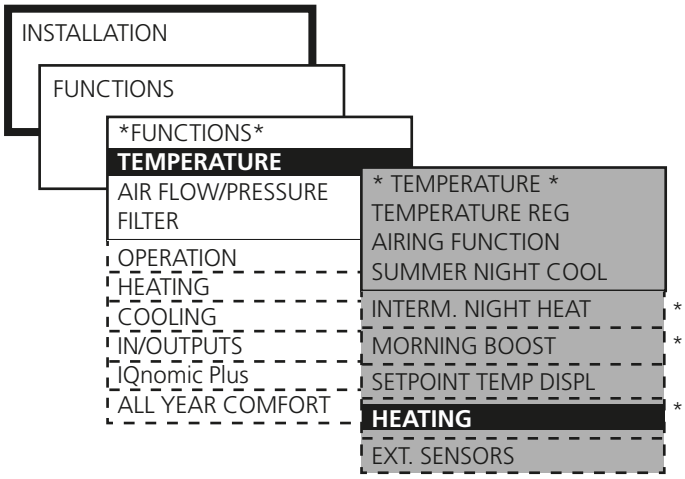
The air handling unit is utilised for heating the room during a preset time period. The function must be activated manually.

The air handling unit switches over to extract air/room regulation (control) of the temperature. The air heater, air recirculation section and BOOSTER function are activated.

Settings:

Value	Setting range	Factory setting
Time for manual heating	hour:min	00:45
EA/Room Temp*	10 - 30 °C	22 °C
SA min*	8 - 20 °C	15 °C
SA max*	16 - 50 °C	28 °C

** If these values are changed, the corresponding values under Morning BOOST will also change.*



** Applies to COMPACT Heat only*

10.2.8 External Temperature Sensors

An external room sensor and external outdoor sensor can be connected to the IQnomic control unit. The sensor can be used when the internal sensor of the unit does not provide representative values.

External Extract air/Room can measure the extract air temperature in a larger room instead of the temperature inside the air handling unit.

External Outdoor measures the outdoor air temperature outdoors, instead of the temperature inside the air handling unit.

Connect the TBLZ-1-24-2 sensor by means of the modular cable supplied, to an optional connection marked Internal BUS 1.

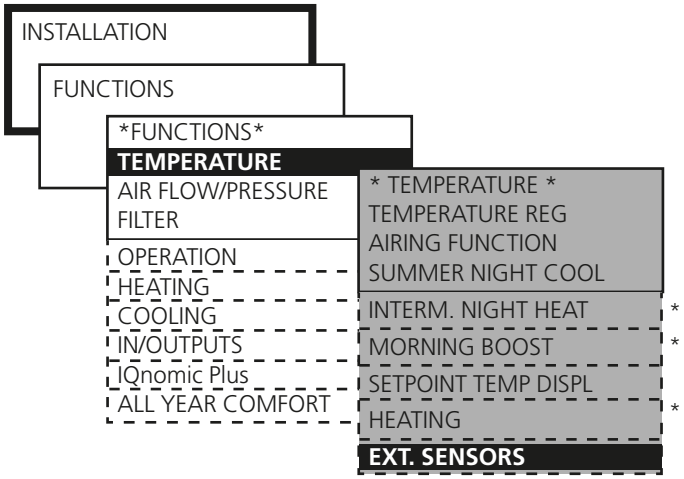
Sensor TBLZ-1-24-2 can be used both as a room sensor and an outdoor sensor. They must therefore be addressed according to function using the function selector switch on the sensor. The function selector switch must be in Position 0 when the room sensor is used and in Position A when an outdoor sensor is used.

If the TBLZ-1-24-2 sensor is installed outdoors, it must be mounted inside an air-tight enclosure.

As an alternative, a temperature reading can be communicated to the air handling unit from a supervisory system, for instance.

Settings:

Value	Setting range	Factory setting
External Extract air/Room	Inactive//IQnomic Communication	Inactive
External Outdoor	Inactive//IQnomic Communication	Inactive
Alarms	0 - 9990 min.	5 min.



** Applies to COMPACT Heat only*

Registered design. The company reserves the right to make design changes without prior notice.

10.3 Flow/Pressure

Basic functions are set at INSTALLATION LEVEL and the values are read and set at USER LEVEL.

10.3.1 Fan Regulation

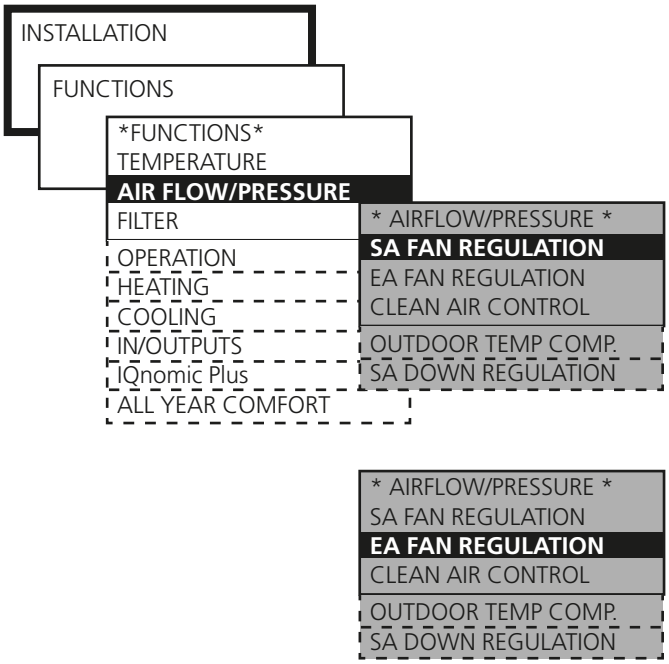
The type of regulation used for the supply air fan and the extract air fan respectively can be selected individually.

10.3.1.1 Flow Regulation

Flow regulation involves operating the air handling unit to keep the preset airflow constant. The speed of the fans is automatically regulated to provide correct airflow even if the filters begin to become clogged, air devices are blocked, etc.

Constant airflow is advantageous, since the airflow always is exactly as it was from the beginning.

It should however be noted that everything that increases the pressure drop in the ventilation system, such as the blocking of air devices and dust accumulating in the filters, causes the fans to run at a higher speed. This causes higher power consumption and may also cause discomfort in the form of noise.



10.3.1.2 Demand Regulation (Control)

The flow demand is regulated via a 0-10 V input signal from an external sensor, such as a carbon dioxide sensor that is wired to control unit terminals 35(-) and 37(+).

Required setpoint (separate for low speed and high speed) is set as a percentage of the input signal.

The function can be limited so that the flow will not be higher or lower than the preset max. and min. permissible values respectively.

10.3.1.3 Slave Control

The flow is constantly regulated to be the same from the one fan as from the other fan. If one fan is pressure-controlled or demand-controlled, the other one can be controlled as a slave to generate the same airflow.

The performance of the fan controlled as a slave can be restricted if its maximum flow is set to a lower airflow rate.

Both fans cannot be controlled as slaves. If both are selected by mistake, the extract air fan will be forced to operate in the flow regulation mode.

Settings:

Value	**Setting**
Fan regulation (SA/EA)	Flow regulation
	Demand control
	Slave control

10.3.1.4 Clean Air Control

The Clean Air Control function is used in ventilation systems where the aim is to control the airflow according to the content of emissions/impurities in the room air.

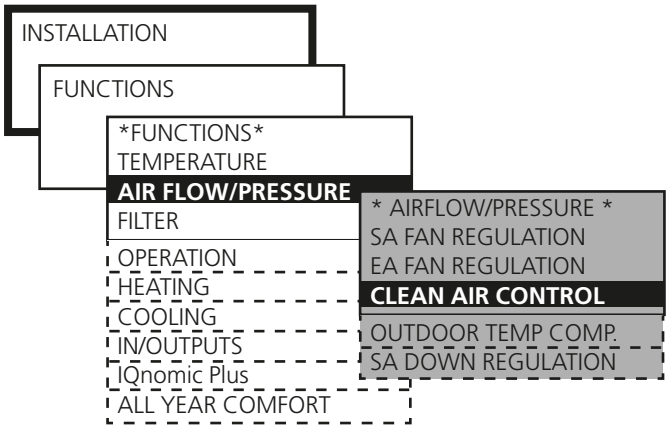
A VOC sensor (Volatile Organic Compounds) is installed inside the air handling unit as standard. This sensor measures the content of emissions/impurities in % VOC.

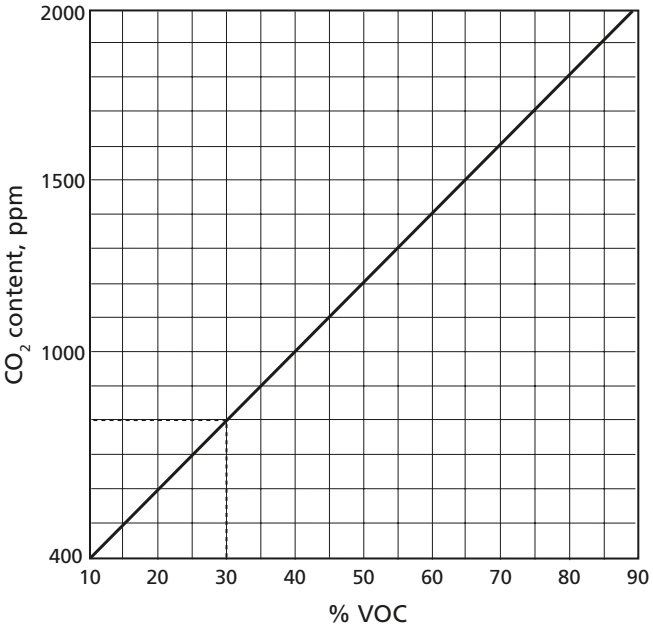
When CO_2 is emitted from an occupant, this creates a proportional amount of, for the VOC sensor, measurable emissions/impurities. For an approximate translation of % VOC to CO_2-content, see the diagram.

When the air handling unit is energised for the first time, the VOC sensor is initialised and this involves transmitting a steady signal of approx. 50% VOC for 6 hours (applies to the VOC sensors with Part No. 328964-01. VOC sensors with Part No. 328964-02 are initiated at the factory). If the unit at a later time is de-energised, and is subsequently reenergised, the sensor is reinitialised for 15 minutes (provided that initialisation during the first energising occasion was not interrupted).

When the VOC sensor measures contents of emissions/impurities that are lower than the preset value; the air handling unit's supply air and extract air flows are then equivalent to the preset min. flows. When the VOC sensor instead measures contents of emissions/impurities that are higher than the preset value, the supply air and extract air flows are variably increased until the preset value or max. flow is reached.

When the Clean Air Control function is activated, the fan regulation modes are automatically selected (extract air fan demand controlled, supply air fan slave controlled). Later on, they can only be read under Functions in the menu.





Example:

800 ppm corresponds to approx. 30% VOC.

If influenced by other emissions/impurities in the air such as cooking smells, cigarette smoke, etc. the VOC content increases in relation to the CO_2 content.

Settings:

Value	Setting range	Factory setting
Clean Air Control	Inactive/Active	Active
VOC low speed	10 - 90 %	50 %
VOC high speed	10 - 90 %	30 %
Min. flow	* m3/s	0.08 m3/s
Max. flow	* m3/s	0.2/0.3 m3/s**

**)The setting range is the same as the min./max. setting of the air handling unit.*
*** Size 02 = 0.2 m3/s, Size 03 = 0.3 m3/s*

Registered design. The company reserves the right to make design changes without prior notice.

10.3.2 Outdoor Temperature Compensation

Airflow

Outdoor temperature compensation of the airflow can be activated if it is desired to reduce the airflow in the winter-time.

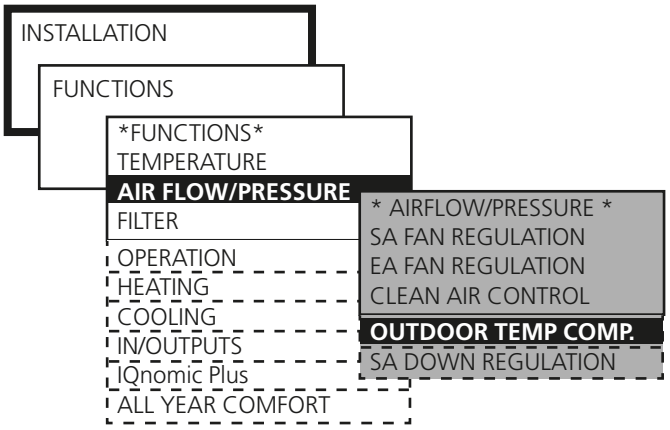
In the flow regulation mode, the current airflow is reduced.

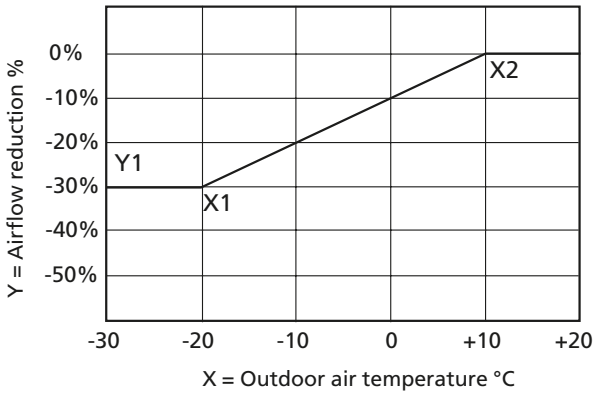
The function has no effect if the airflow is demand-controlled.

The airflow is reduced as a percentage of the current airflow/pressure.

Settings:

Value	Setting range	Factory setting
Y1, max permissible reduction	0-50%	30 %
X1, breakpoint	-30 – -10 °C	-20 °C
X2, breakpoint	-10 – +15 °C	+10 °C





Outdoor air compensation according to factory settings involves:

Outdoor temperature +10 °C (Breakpoint X2): Compensation starts and gradually proceeds between 0–30 % down to outdoor air temperature -20 °C.

Outdoor air temperature -20 °C (Breakpoint X1): Constant compensation proceeds at 30 % (max reduction Y1).

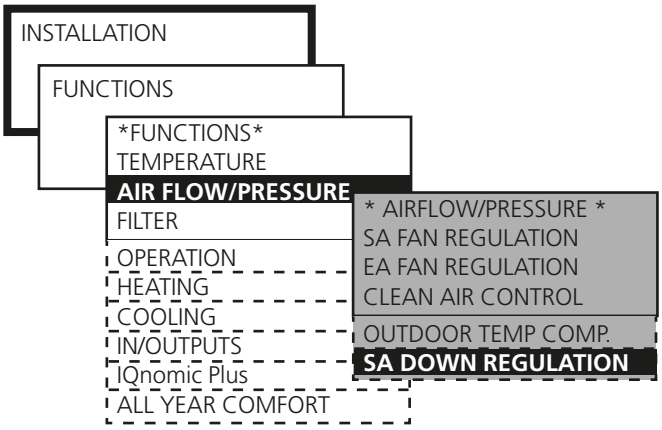
10.3.3 Downspeed Control of Fan Speed to Min. Set Point, Airflow

Regulation of the supply airflow to a lower flow rate is the last step in the regulation sequence on increasing heating load for ERS regulation. The extract air fan cannot be selected alone; only the supply air fan or both the supply air and extract air fans can be selected.

See Section 10.2 as well.

An adjustable temperature decrease allows a lower supply air temperature setpoint, before down regulation begins.

This neutral zone can be set on line NZ SA DOWN REGULATION in the appropriate menu.



Settings:

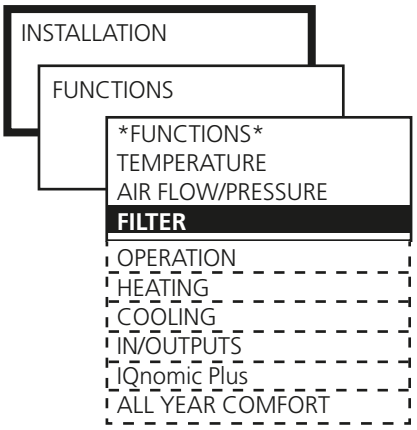
Value	Setting range	Factory settings
Function	Inactive/SA/SA+EA	Active
Neutral zone	0.0-10.0 °C	0.0 °C

10.4 To Activate the Filter Monitoring Function

The filter monitoring can take place in two ways, by rating or with a pressure sensor.

Rated filter monitoring is activated on delivery.

If filter monitoring with pressure sensor is required, it must be activated for the filters that are to be monitored.



Rated (factory-preset)
The filters are calibrated at 60% and 90% of the motor signal. The airflow and fan speed are read and are stored for rating the filters' calibration value. If the unit operates above the 60% motor signal, the current airflow and the fan speed are continuously compared to the calibration values. If the current values are greater than the calibration value + preset alarm limit, an alarm is initiated.

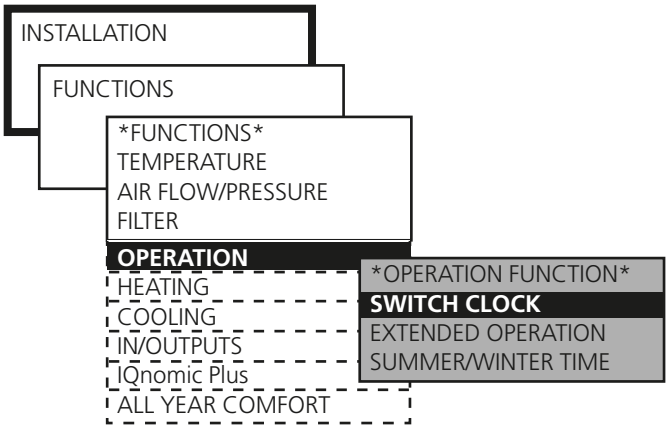
With pressure sensor (optional under Service Level)
The pressure drop across the filter is continuously monitored and an alarm will be initiated if the current pressure is greater than the calibration value + preset alarm limit.

Settings:

Value	Setting range	Factory setting
Standard filter	Inactive/SA/EA SA+EA	SA+EA

Registered design. The company reserves the right to make design changes without prior notice.

10.5 Operation



10.5.1 Switch clock

Basic functions are set at INSTALLATION LEVEL and the values are read and set at USER LEVEL.

The switch clock controls the operating times of the unit. The following two basic functions can be set:

LOW SPEED – HIGH SPEED
Low speed is the basic level and times for high speed operation are set at USER LEVEL under SWITCH CLOCK.

STOP – LOW SPEED – HIGH SPEED
Stop is basic level and times for low speed and high speed operation are set at USER LEVEL under SWITCH CLOCK.

Settings:

Value	Setting range	Factory settings
Function	Low speed/High speed Stop/Low speed/High speed	Low speed/High speed

10.5.2 Extended Operation

The control unit's inputs, INP. 1 (terminals 5 and 6) and INP.2 (terminals 7 and 8) can be selected for the external high speed and external low speed functions. They can be used for overtime running activated by a pushbutton, for example.

Desired time in hours and minutes can be set as follows.

The time period preset for manual high speed is applicable to extended (overtime) operation in Main Menu 1.

Settings:

Value	Setting range	Factory settings
External low speed	0:00 - 23:59	0:00
External high speed	0:00 - 23:59	0:05
Man. High speed	0:00 - 23:59	0:45
	(hour:min)	(hour:min)

10.5.3 Summer time/Winter time

The time and date readings include factory-preset automatic changeover from summer time to normal time and vice versa, thus conforming to EU standard (the last Sunday in March and the last Sunday in October respectively).

This automatic changeover can be blocked and set as inactive.

Settings:

Value	Setting range	Factory settings
Summer time/Winter time	Inactive/active	Active

10.6 Heating

10.6.1 Heat exchanger

10.6.1.1 Defrosting the rotary heat exchanger

In environments where the extract air can occasionally be humid, the defrosting function can be activated to protect the heat exchanger from frosting. The function continuously monitors the condition of the heat exchanger rotor to prevent condensate from freezing in the rotor passages and clogging them.

The function requires a separate pressure transducer, preset for heat exchanger defrosting, is wired to the control unit inputs for external BUS communication (Internal BUS-1). Two nipples must be fitted to the sheet metal wall inside the unit's extract air duct. See the illustration. Run hoses through the insulation and connect them to the pressure sensor'sminus and plus nipples.

See special installation instruction for the TBLZ-1-23-aa Pressure sensor.

The pressure drop across the rotor must then be calibrated to establish a reference pressure drop for monitoring purposes. See Section 8.4.3.

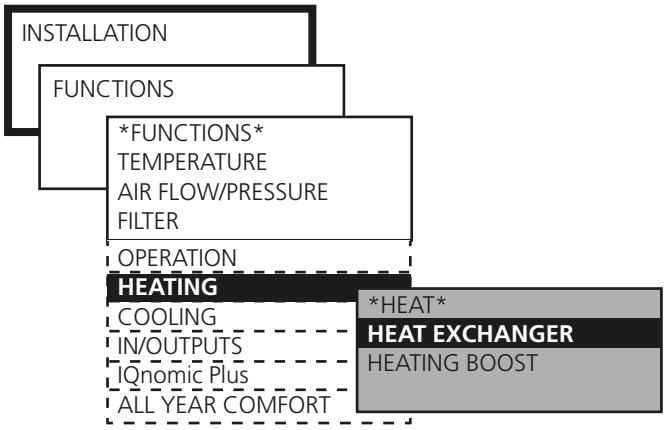
When the function is activated the pressure drop across the heat exchanger is continuously measured and the value is compared with the calibration value. If the pressure drop exceeds the preset limit value, a defrosting sequence is implemented where the rotor speed is gradually ramped down (ramp time of max. 4 minutes) to the speed at which the pressure drop across the heat exchanger has decreased to half of the preset limit value. The rotor speed can be 0.5 rpm but not slower. During the defrosting operation, warm extract air thaws any possible ice coating. A time delay of 4 minutes gives the heat exchanger a chance to dry, before the rotor once again is ramped up (ramp time max. 4 minutes) to its ordinary speed.

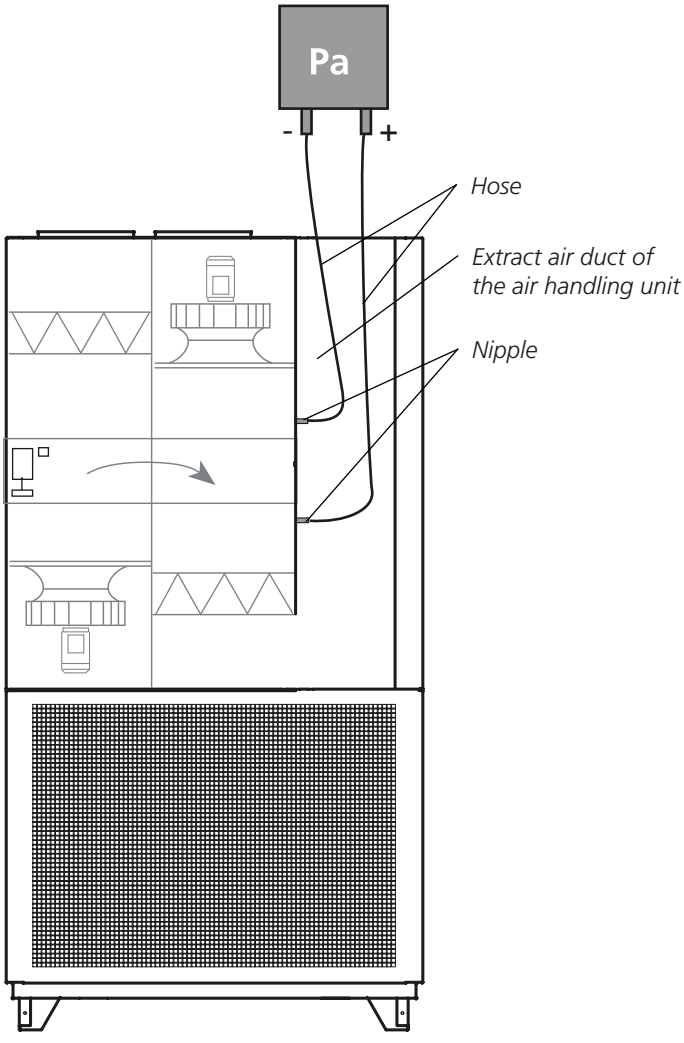
The max. duration of the defrosting operation is 30 minutes. If the pressure drop has not decreased within this max. duration on six occasions during a 24-hour period, an alarm is tripped.

Note that the heat exchanger performs less efficiently while defrosting is in progress and that the supply air temperature will decrease downstream of the heat exchanger.

Settings:

Value	Setting range	Factory settings
Defrosting	Inactive/active	Inactive





Connection principle for the defrosting function with separate pressure transducer.

Registered design. The company reserves the right to make design changes without prior notice.

10.6.1.2 Heating BOOST (applies to COMPACT Heat only)

Heating boost means that the air handling unit, operating in the normal flow regulation mode, increases both the supply airflow and the extract airflow in order to carry more heat into the premises.

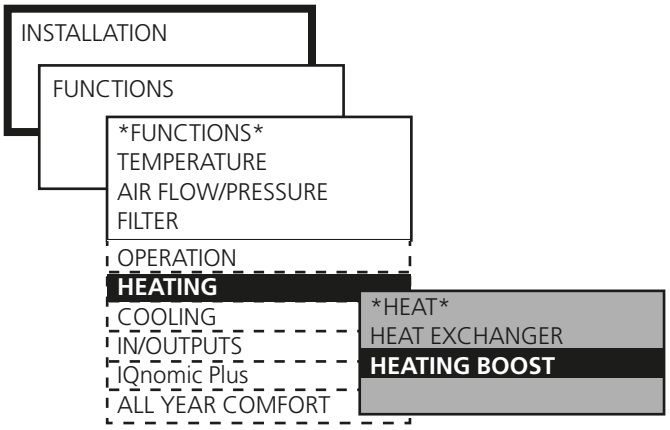
The fans are allowed to work in the range between current flows (low speed, high speed) and preset max speed flow.

The function only works if the air handling unit is operating in the extract air regulation mode. If demand control or boost is selected in combination with heating boost, the flow is controlled by the function that transmits the highest output signal to the fans.

A regulated ramp function begins and increases the airflow if the temperature exceeds its setpoint and it differs 2-10°C (3°C has been factory preset) to the preset max. supply air temperature. The control reaction speed (ramp time = % flow increase/minute) can be set. The highest possible airflow is limited by the max. flow. For particulars on setting the max. flow, see Section 8.2.

Settings:

Value	Setting range	Factory settings
Heating BOOST	Inactive/active	Inactive
Start limit	2-10 °C	3 °C
Ramp time	0.5-15%	2.5%



10.7 Cooling(Applies to an air cooler installed in the outdoor air duct only)

Cooling function 0-10 V and 10-0 V require an IQnomic Plus module (function selector switch set to position 6). The module is automatically activated. Wire the cooling connections to the IQnomic Plus module. See separate instruction TBIQ.

Other functions can be connected to the control unit or the IQnomic Plus module. If the function is connected to the IQnomic Plus module, activation will take place automatically.

10.7.1 Operation

Activate the cooling function.

10.7.2 Temperature Regulation (Control)

Stepless 0-10 V DC
Used when variable cooling control is connected. The COMPACT air handling unit's cooling controller modulates a 0-10 V DC signal that is linear with the cooling load.

Both the cooling relays of the unit operate in parallel with the signal and are energized when the cooling signal exceeds 0.5 V DC and are de-energized when the signal drops below 0.2 V DC.

Connect the output for Cooling relay 1 and Cooling relay 2 to terminals 1-2 and 3-4 on the control unit.

Stepless 10-0 V DC
Same as above, but the control signal is inverted where a 10 V output signal means a 0 % cooling load.

On/off, 1 Step
Used if cooling in one step is connected. The air handling unit's cooling controller regulates the cooling load at 0-100 %. Cooling relays 1 and 2 are energized when the cooling load exceeds 5 % and are de-energized when the cooling load is less than 2 %.

The output contact for 0-10 V DC control signals operates in parallel with the 0-100 % cooling demand and can be used for indicating the cooling demand, for instance.

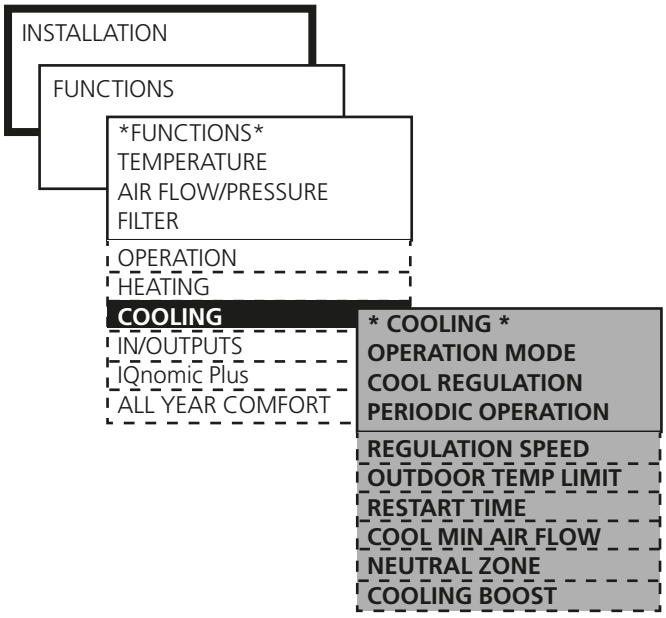
On/off, 2 steps
Used when cooling in 2 steps is connected. The air handling unit's cooling controller regulates the cooling load at 0-100 %. Cooling relay 1 is energized when the cooling load exceeds 5 % and is de-energized when the cooling load is less than 2 %. Cooling relay 2 is energized when the cooling load exceeds 55 % and is de-energized when the cooling load is less than 50 %.

The 0-10 V DC control signal output operates in parallel with the 0-100 % cooling demand and can be used for indicating the cooling demand, for instance.

On/off, 3 Steps - Binary
Used when cooling with two inputs controlled with three binary steps is connected. The cooling controller of the unit regulates the cooling demand at 0-100 %.

On an increasing cooling load:
Cooling relay 1 is energized when the cooling load is above 5 % and is de-energised when the cooling load is between 40-70 %. Cooling relay 2 is energized when the cooling load is above 40 %. Cooling relay 1 is energized again (together with cooling relay 2) when the cooling load is above 70%.

On a decreasing cooling load:
Cooling relay 1 drops when cooling load is below 60 %, it is energized again when cooling load is below 30 % and drops again when cooling load is below 2 %. Cooling relay 2 drops when coolng load is below 30 %.



The output for 0-10 V DC control signals operates in parallel with the 0-100 % cooling load and can be used for indicating the cooling demand, for instance.

Settings for cooling functions on this page and the next:

Value	Setting range	Factory settings
Operation mode	Inactive/active	Inactive
Cooling regulation	Stepless 0-10 V Stepless10-0 V On/Off 1 step On/Off 2 step On/Off 3 step binary	On/Off 1 step
Periodic operation		
Cooling relay 1	Inactive/pump/ pump+valve/valve	Inactive
Cooling relay 2	Inactive/pump/ pump+valve/ valve	Inactive
	Exercise period	1 – 60 min.
	3 min.	
Interval	1 – 168 hrs.	24 hrs.
Regulation speed between steps	0-600 sec	300 sec
Outdoor temperature limit		
Step 1	0-25 °C	3 °C
Step 2	0-25 °C	5 °C
Step 3	0-25 °C	7 °C
Restart time	0-900 sec	480 sec
Cooling min air flow		
Supply air	0-Max flow	–
Extract air	0-Max flow	–
Neutral zone	0-10 °C	2.0 °C
Cooling BOOST	Inactive Comfort Economy Sequence Comfort+economy Economy+ sequence	Inactive
Start limit in connection to min supply air temp	2-10 °C	3 °C
Ramp time	0.5-15%	2.5%

Registered design. The company reserves the right to make design changes without prior notice.

See preceding page for possibilities of setting.

10.7.3 Periodic Operation

Can be selected to run pumps if cooling relay 1 and/or 2 are used.

The exercising mode can be selected for "pump", "pump + valve" or "valve" only (0 - 10 V output). The pumps are exercised 2 minutes per day if this is activated.

10.7.4 Regulation Speed

The required delay period between the various cooling steps can be set.

This is done so that a compressor, for instance, will have time to generate required cooling capacity before the next cooling step is switched in.

This applies to changeover from step 1 to step 2 and from step 2 to step 3; and only on an increasing cooling load.

10.7.5 Outdoor Temperature Limit

Provision is available for setting an outdoor temperature-related blocking function in 3 steps. If the outdoor temperature is below each step limit, the function of the cooling relays will be blocked.

This function also restricts the 0-10 V output signal to transmission in steps.

Step 1 maximises the output signal to 2.5 V, step 2 to 5.0 V and step 3 to 7.5 V.

10.7.6 Restart Time

The time should be set in such a way that it follows the recommendations of the cooling machine supplier for the number of starts per hour.

The restart time is calculated from the time when a relay is energized to when it is allowed to be energized again.

The 0-10 V signal is delayed during the same period.

10.7.7 Cooling Min Air Flow

In order for the cooling function to operate the supply air and extract air airflows must be greater than their respective limit values (preset at USER LEVEL under FLOW/PRESSURE).

The cooling min flow function can be blocked by setting both flow limits to 0.

10.7.8 Neutral Zone

The neutral zone prevents the cooling and heating systems from counteracting each other.

Preset neutral zone is added to the setpoint for heating and the sum of these provides the setpoint for cooling.

10.7.9 Cooling BOOST

Cooling BOOST means that the supply air and extract air airflows are increased to convey more cooling energy to the premises.

Cooling BOOST cannot be combined with pressure regulation.

The flow increase takes place between current flow and preset max flow.

The function can be selected in three variants as follows:

Comfort
The cooling outputs are activated if there is a cooling load.

When the temperature exceeds its setpoint and the supply air temperature is within the preset limit, a regulated ramp function begins and increases the flow. The control reaction speed (ramp time = % flow increase/minute) can be set. The highest possible airflow is limited by the max. flow. For particulars on setting the max. flow, see Section 8.2.

Economy
Cooling BOOST Economy first uses a higher airflow to cool the premises, before a start signal is transmitted to the cooling machines.

The function can also operate without the cooling function being activated.

On a cooling load, the flows are slowly increased up to preset maximum flow. When the flows are up to max and if a cooling load is still present, the output contacts for cooling are activated.

The cooling boost function requires an outdoor air temperature of at least 2 °C lower than the extract air temperature for it to be activated. Normal cooling operation is activated if the temperature difference is too small.

Sequence
The cooling BOOST Sequence is used if a cooling machine is sized for a higher than normal cooling flow.

If there is a cooling load, the flow is increased up to the preset max flow before the cooling function is activated. The cooling function is delayed 1 minute after the airflow is increased.

The cooling boost sequence is blocked if no cooling function has been selected.

Comfort + Economy
Cooling BOOST Comfort + Economy is a combination of the two variants for increasing the airflow.

If the conditions for Cooling BOOST Economy are met, the unit will begin increasing the airflow before the cooling unit starts up.

If the conditions for outdoor air are not met, the flow increase will begin when the supply air temperature reaches the preset Min. permissible temperature.

Economy + Sequence
Cooling BOOST Economy + Sequence is a combination of the two variants for increasing the airflow.

If the conditions for Cooling BOOST Economy are met, the unit will begin increasing the airflow before the cooling unit starts up.

If the conditions for outdoor air are not met, the unit will begin increasing the airflow when the cooling unit starts up.

10.8 Input/output connections

Outputs
The control unit has two relay-controlled outputs, terminals 1-2 and 3-4.

They must be individually set to the function they are to have.

N.B.! A maximum of two of the functions below can be combined as standard. The number of combinations can be increased to four using the TBIQ IQnomic Plus module accessory. See separate instructions.

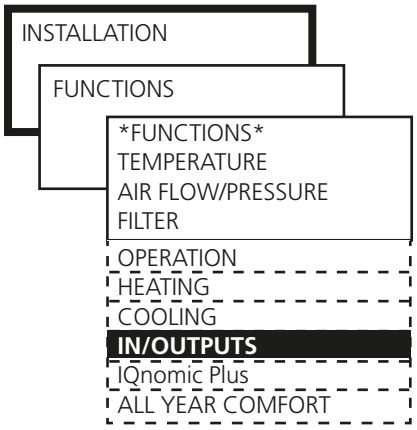
Optional functions:
- Damper, output: For control of the outdoor air/exhaust air damper
- Operation, output: For indicating unit in operation.
- Low speed, output: For indicating low speed operation.
- High speed, output: For indicating high speed operation.
- A Alarm, output: For group alarm A.
- B Alarm, output: For group alarm B.
- Heating, output: For indicating that the reheater is operating.
- Cooling, output 1: For controlling external cooling.
- Cooling, output 2: For controlling external cooling.

Inputs
The control unit has two digital outputs, terminals 5-6 and 7-8.

They must be individually set to the function they are to have.

N.B.! A maximum of two of the functions below can be combined as standard. The number of combinations can be increased to four using the TBIQ IQnomic Plus module accessory. See separate instructions.

Optional functions:
– External stop. The unit will stop if the input is not closed.
– External LS: For external overtime operation via timer (switch clock), from stop to low speed operation.
– External HS: For external overtime operation via timer (switch clock), from stop or low speed operation to high speed operation.
– External Alarm 1: For connection of External Alarm 1.
– External Alarm 2: For connection of External Alarm 2.
– External reset: For connection of pushbutton for resetting a tripped alarm.
External fire alarm: A fire alarm will trip if the input is not connected.

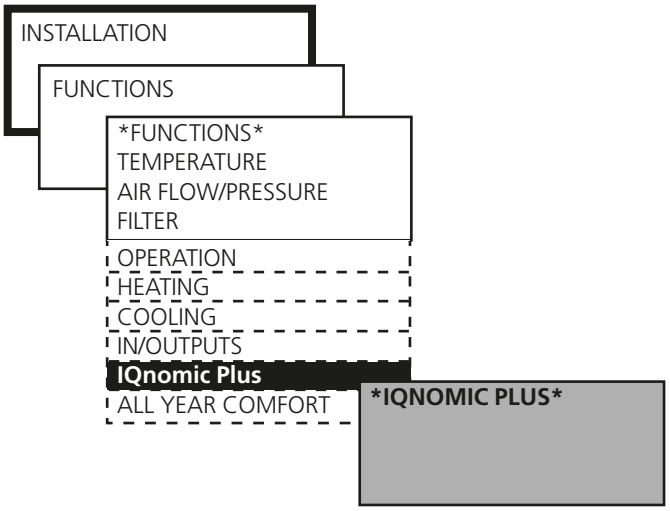


Registered design. The company reserves the right to make design changes without prior notice.

10.9 IQnomic Plus

IQnomic Plus is a name given to additional modules for extra control functions, such as external monitoring and cooling.

See special instructions.



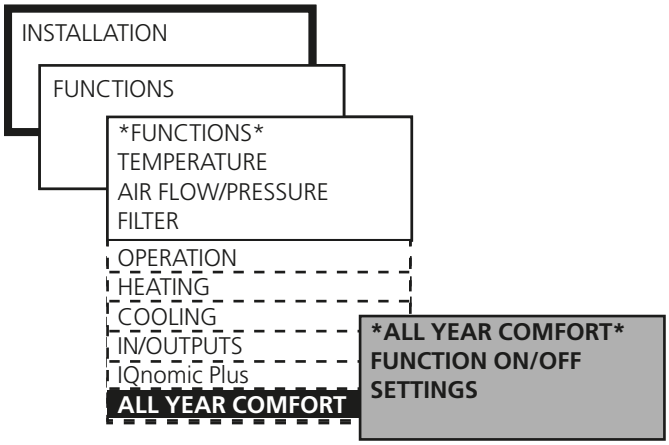
10.10 All Year Comfort

The All Year Comfort function controls the supply flow temperature to comfort modules, chilled beams, perimeter climate systems, etc. via regulating valves. Two strap-on temperature sensors fitted either to the water pipe or the regulating valve are used for measuring the water temperature.

The function requires the electrical equipment cubicle accessory (TBLZ-1-59-a-b-cc) for controlling the supply flow water temperature. The function selector switch of the electrical equipment cubicle must be set to position 7.

All Year Comfort has functions for outdoor compensation, room compensation, night compensation, dew point compensation and for controlling pump and valve exercising.

For further information, see the Guide to the All Year Comfort Function.



Settings:

Value	Setting range	Factory settings
All Year Comfort	Inactive Cooling Heating Cool.+Heat.	Inactive
Heating water temperature (°C)	10-80°C	30
Cooling water temperature (°C)	5-30°C	14
Outdoor comp. Heat. water	Active Inactive	Inactive
Outdoor temp. (X1) (°C)	-40 - 40°C	-20
Heating water (Y1)(°C)	10 - 80°C	40
Outdoor temp. (X2)(°C)	-40 - 40°C	5
Heating water (Y2)(°C)	10 - 80°C	30
Outdoor temp. (X3)(°C)	-40 - 40°C	15
Heating water (Y3)(°C)	10 - 80°C	20
Outdoor comp., Cool. water	Active Inactive	Inactive
Outdoor temp. (X1) (°C)	-40 - 40°C	10
Cooling water (Y1)(°C)	5 - 30°C	22
Outdoor temp. (X2)(°C)	-40 - 40°C	20
Cooling water (Y2)(°C)	5 - 30°C	18
Outdoor temp. (X3)(°C)	-40 - 40°C	25
Cooling water (Y3)(°C)	5 - 30°C	14
Room comp., Heating water	Active Inactive	Inactive
Room temperature (°C)	0 - 40°C	21
P-band (°C)	1 - 10°C	5
Night blocking	Active Inactive	Active
Room comp., Cooling water	Active Inactive	Inactive
Room temperature (°C)	0 - 40°C	21
P-band(°C)	1 - 10°C	5
Night blocking	Active Inactive	Active
Night comp., heating water	Active Inactive	Inactive
Temp. comp. (°C)	-10 - +10°C	-2
Night comp., Cooling water	Active Inactive	Inactive
Temp. comp. (°C)	-10-+10 °C	2
Night comp.	Inactive Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday-Friday Monday-Sunday Saturday-Sunday	Inactive
Channel	1-2	
Pump op., Heating water Outdoor temp. Start (°C)	-40 - 40°C	15
Pump op., Heating water Outdoor temp. Stop (°C)	-40 - 40°C	18
Pump op., Cooling water Outdoor temp. Start (°C)	-40 - 40°C	-20
Pump op., Cooling water Outdoor temp. Stop (°C)	-40 - 40°C	-25
Pump/valve		
Pump alarm, heating water	Inactive Normally closed Normally open Contactor	Inactive
Valve, heating water	Active Inactive	Inactive
Pump alarm, cooling water	Inactive Normally closed Normally open Contactor	Inactive
Valve, cooling water	Active Inactive	Inactive
Exercising, heating water	Inactive Pump Pump+Valve Valve	Inactive
Exercising period, (min)	1-60 min	3
Interval (h)	1-168 h	24
Exercising, Cooling water	Inactive Pump Pump+Valve Valve	Inactive
Exercising period, (min)	1-60 min	3
Interval (h)	1-168 h	24
Dew point comp.	Active Inactive	Inactive
Neutral zone(°C)	0-5°C	2
Comp. flow (%)	0-30%	10

Registered design. The company reserves the right to make design changes without prior notice.

11 AUTOMATIC FUNCTIONS

11.1 General

The COMPACT has a number of automatic functions. The operation of the unit is influenced when certain functions are activated.

11.1.1 Starting Sequence

The COMPACT has a starting sequence with factory-preset time delay between every step as follows:

1. The damper relay is energized and opens the shut-off damper (if installed).

Time delay: 30 seconds.

2. The extract air fan starts and the heat exchanger is controlled to provide max. heat recovery.

Time delay: 90 seconds.

3. The supply air fan starts.

Time delay: 180 seconds (from the time when the extract air fan has started).

4. The temperature regulation function begins according to its regular settings.

The starting sequence prevents the extract air fan from starting if the shut-off damper is closed. By starting the extract air fan first, and the heat exchanger as well, the system also avoids chilling the premises with cool supply air under cold weather conditions.

11.1.2 Cooling Recovery

Cooling energy recovery is an automatic function that helps the air handling unit utilize the relative "cooling energy" that may be present indoors if cooling is required and the outdoor temperature is high.

The heat exchanger rotates at max. speed and in this way recovers the relative cooling energy or chilliness in the extract air.

The conditions for this function to be activated are that there is a cooling demand and that the outdoor temperature is 1 °C higher than the extract air. The function is switched out when the cooling load ceases to exist or when the outdoor temperature is the same as that of the extract air.

The text COOLING RECOVERY is shown in the hand-held micro terminal.

11.1.3 Zero Point Calibration

The pressure transducer of the unit is automatically calibrated. This calibration is carried out 3 minutes after the unit has been stopped.

The text ZERO PT CALIBR is shown in the hand-held micro terminal.

The fans cannot start while calibration is in progress.

11.1.4 Additional cooling – Electric Air Heater

The fans continue to operate at min speed for 3 minutes after the air handling unit has been stopped to cool the electric heating elements if the electric air heater has been operating.

The text ADD COOLING appears in the hand-held micro terminal.

11.1.5 Additional running - Heat Exchanger

The rotary heat exchanger automatically continues to rotate ca 1 minute after the air handling unit has been stopped.

It takes a little time for the fans to stop rotating after a stop order has been entered in the micro terminal. This prevents the admission of cool supply air into the premises.

11.1.6 Density-corrected Airflow

The density of the air is different at different temperatures. This means that a specific volume of air will change at different air densities.

The GOLD automatically corrects this, so that correct air volume is always obtained.

The control equipment always shows the corrected airflow.

11.1.7 BOOSTER-function (Applies to COMPACT Heat only)

COMPACT Heat can be used for heating the room with BOOSTER function.

If the BOOSTER function is used, the extract air fan and the heat exchanger are switched off. The damper in the air recirculation section is reset and room air is circulated. The louvre damper for exhaust air closes to prevent any cold down draught.

The electric air heater (7.5 kW) heats up the air. A changeover damper in the lower section of the air handling unit is reset and the air is led to the air discharge outlets at the bottom of the unit. The air is discharged at high velocity and follows the floor surface by means of the so-called coanda effect. This enables long throw lengths and quickly heats the entire premises.

The BOOSTER function is activated automatically when the supply air temperature is higher than the extract air temperature or the room temperature.

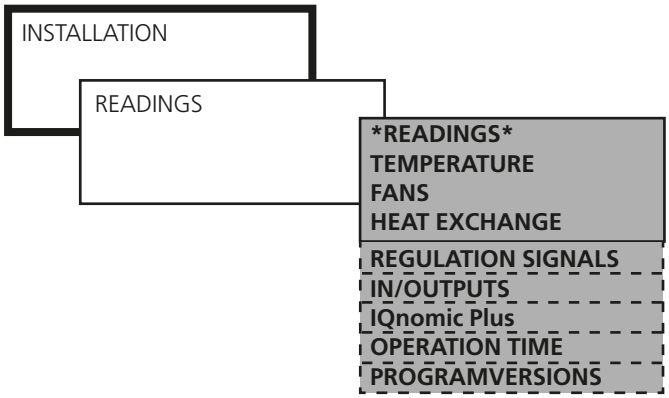
12 READINGS

The operating status and the values can be read. Used for performance checks and for generally checking values, settings, power consumption, etc.

No values can be altered in this menu group.

Each menu indicates which values can be read.

The operation times per 24 hour period are given under the OPERATION TIME menu.



13 MANUAL TEST

⚠ Note! Manual test running can cause indoor comfort problems. There is also risk of overloading the system. The responsibility for discomfort and overload rests totally on the person who activates the function.

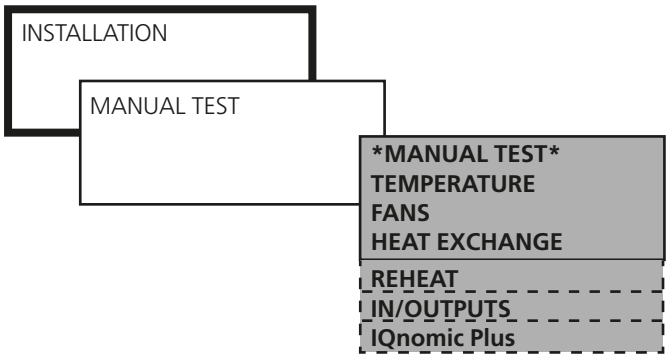
Manual test run can take place for testing the inputs and outputs, fans and heat exchanger, etc.

Used when the air handling unit is first installed to make sure that all the connections have been correctly wired.

Most alarms, functions and normal control modes will be blocked while manual testing is in progress.

On a return to the other menu groups, the controller resumes normal operation and all settings for manual testing will be terminated.

Each menu indicates which functions can be test run.



Registered design. The company reserves the right to make design changes without prior notice.

14 ALARM SETTINGS

14.1 Fire Alarms

EXTERNAL FIRE ALARM
Input Inp. 1 or Inp. Can be used for external fire-control equipment. Manual or automatic resetting of alarms can be selected.

INTERNAL FIRE ALARM
The air handling unit's internal temperature sensors serve as fire protection thermostats. An alarm is initiated if the supply air temperature sensor registers more than 70 °C or when the extract air temperature sensor registers more than 50 °C.

If an external Extract air/Room temperature sensor is connected and activated, this works parallel with the extract air temperature sensor of the unit.

FANS IN THE EVENT OF A FIRE
The fans in the air handling unit can be used for evacuating gases, etc. The activated function works together with the External fire/smoke function or Internal fire alarm.

If the air handling unit is idle, the pre-selected fans will start up regardless of whether External Stop or Manual Stop has been activated in the control display..

The damper relay in the air handling unit is energized and the operating relay drops.

The dampers pre-selected for service in the event of a fire, should be wired to the damper relay and these dampers will open.

The dampers that are meant to close in the event of a fire, should be wired to the in-operation relay (control unit terminals 19-21) and these dampers will close.

FAN SPEED IN THE EVENT OF FIRE
Will be activated automatically if the fans have been activated in event of fire (see above), and make it possible to restrict the max speed of the fans.

Settings:

Value	Setting range	Factory setting
Internal fire alarm	0=inactive 1=activated	0
External fire alarm	auto/manual	manual
Fan in event of fire	Inactive/EA/SA/ SA+EA	Inactive
Fan speed in event of fire, SA	10-100%	100%
Fan speed in event of fire, EA	10-100%	100%

14.2 External Alarms

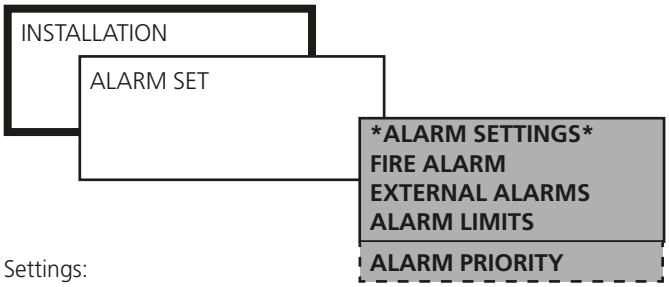
EXTERNAL ALARMS 1 and 2
The Inp. 1 and Inp. 2 inputs can be used for external alarms (can be selected under Inputs/Outputs).

Typical uses:

– Motor protection for the circulation pump in the heating or cooling circuit.

– Service alarm actuated by smoke detectors.

Set the time delay and set whether the alarm shall be activated on closure or disconnection of the input.



Settings:

Value	Setting range	Factory settings
Time delay	1-600 sec	10 sec
Alarm at closure	1=closure 0=disconnection	1
Alarm reset	0=auto/1=man	0

14.3 Alarm Limits

Changes in the factory-preset alarm limits should only be made if you have special reasons for doing so and you should be aware of the consequences.

TEMPERATURE
DEVIATION SA-TEMP (deviating supply air temperature) indicates how much the supply air temperature is allowed to be below the supply air temperature setpoint before an alarm is initiated.

MIN EA-TEMP (min extract air temperature) indicates how low the extract air temperature is allowed to be before alarm is initiated.

FILTERS
SUPPLY AIR/EXTRACT AIR indicates at which level of contamination in the supply air filter that an alarm will trip.

HEAT EXCHANGER
ALARM LIMIT indicates at which pressure rise an alarm will trip, if there is an extra installed pressure transducer for the defrosting function of the heat exchanger.

SERVICE PERIOD
SERVICE PERIOD indicates the period until the next service.

Settings:

Value	Setting range	Factory settings
TEMPERATURE		
Deviating supply air temp.	2-15 °C	5 °C
Min extract air temp.	8-20 °C	15 °C
FILTERS		
Supply air	50-300 Pa/ 5-20%*	100 Pa/ 10%*
Extract air	50-300 Pa/ 5-20%*	100 Pa/ 10%*
HEAT EXCHANGER		
Alarm limit	30-100	Pa 50 Pa
SERVICE PERIOD		
Alarm limit	0-99 months	12 months

**Depending on the choice of monitor function.*

14.4 Alarm Priority

There should be special reasons for alteration of alarm priority and you should be aware of the consequences.

Changes in priority should only be made if you have special reasons for doing so and you should be aware of the consequences. The priority of certain alarms cannot be changed.

Settings:

See 19.2 Alarm Descriptions.

15 CONTROL DISPLAY

15.1 Language

The language desired can be set here. Normally this setting is entered when the air handling unit is started for the first time and the question ÄNDRA/CHANGE? automatically appears in the control display.

However, the language setting can be changed at any time.

Settings:

Value	Setting range	Factory settings
Language	Current languages is listed in the menu.	English

15.2 Air flow unit

The air flow unit desired can be set here.

Settings:

Value	Setting range	Factory settings
Flow unit	l/s m3/s m3/h	m3/s

15.3 Min/Max Adjustment

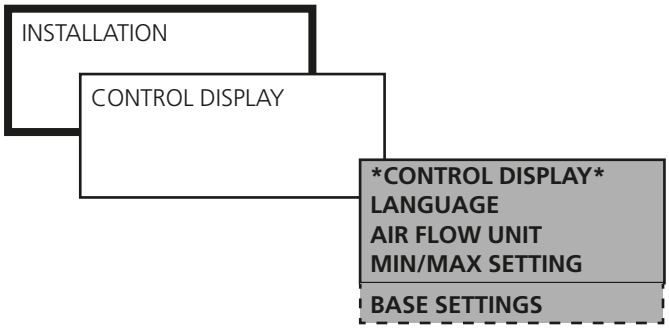
Used for restricting the setting range at user level for setpoints as well as for min. and max. temperature limits.

Settings:

Value	Setting range	Factory settings
For ERS regulation 1		
Breakpoint, min	12-26°C	15°C
Breakpoint, max	12-26°C	23°C
EA/SA Diff, min	1-7°C	1°C
EA/SA Diff, max	1-7°C	5°C

EA = Extract air
SA = Supply air

ERS= Extract air temperature-related supply air temperature-regulation



15.4 Base Settings

Used for saving and resetting the settings.

BASE SETTINGS 1 and 2 are two levels where the user him-/herself saves current settings and activates them when needed.

The two base settings can be used as a summer setting and as a winter setting of the air handling unit.

The values in INITIAL SETTING 1 and 2 saved in the internal memory can be transferred to the external MMC memory by entering SAVE SETTINGS. EXTERNAL MEMORY.

The values can be transferred from the external MMC memory to the internal memory by entering FETCH EXTERNAL MEMORY.

INITIAL SETTING 1 and 2 must be downloaded into the control unit by entering INTERNAL MEMORY, LOAD NEW SETTINGS.

Under SAVE EXTERNAL MEMORY, there is a function that can save current settings to the MMC memory.

Current settings can be stored directly in the control unit under FETCH EXTERNAL MEMORY

FACTORY SETTINGS resets the air handling unit's settings to the original values it had when it was supplied (See 22.2 Commissioning Record).

The preset values for communication and alarm priority are not reset if the factory settings are reinstated.

Settings:

Value	Setting range
Save/fetch setting	
Save setting – internal memory	Save new setting 1
	Save new setting 2
external memory	Save setting 1
	Save setting 2
	Save current setting
	Save all
Load/fetch – internal memory	Load new setting 1
	Load new setting 2
external memory	Fetch setting 1
	Fetch setting 2
	Fetch current setting
	Fetch all
Factory setting	Activate

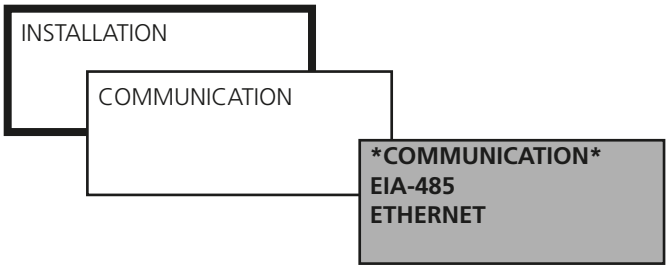
Registered design. The company reserves the right to make design changes without prior notice.

16 COMMUNICATION

Provision for communication and supervision is integrated as standard into the COMPACT. The unit is ready to be connected via EIA-485 and Ethernet. For particulars of connecting and wiring the air handling unit, see Section 21.3.3 Wiring to Terminals.

Communication can also be established via Ethernet without software other than an ordinary web browser such as Internet Explorer.

Further information about interfaces, protocol and configuration is available at www.swegon.se (com) under Products/Air handling units/COMPACT air handling units/Documentation.



16.1 EIA-485

Protocol and settings for EIA-485 is specified.

Settings:

Value	Setting range
Modbus RTU Metasys N2 Lon Works Exolinc	Address, speed, parity, stop bits

16.2 Ethernet

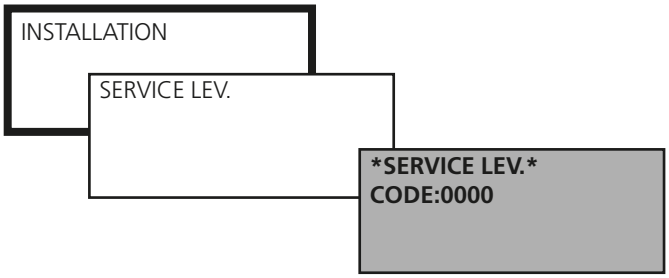
Protocol and settings for Ethernet is specified.

Settings:

Value	Setting range
Ethernet	MAC ID DHCP SERVER (active or inactive) IP ADDRESS (static or dynamic + port no.) SUBNETM. GATEWAY DNS-SERVER MODBUS TCP CLIENT (IP address, netmask and port number) BACNet IP (active or inactive, Device ID, Port no.)

17 SERVICE LEVEL

A code and special training are required for access to this menu group.



18 MAINTENANCE

Warning

Before carrying out any work, make sure that the power supply to the unit has been isolated.

18.1 Filter Change

The filters should be changed when the filter alarm has been activated.

Order new filters from Swegon or its representative!

Specify the type of air handling unit and whether the change of filters involves one or two directions of airflow.

18.1.1 To remove the Filters

Pull out the handles to free the filters from the filter holder. Withdraw the filters.

It is advisable to clean inside the filter space while the filters are gone.

18.1.2 To fit new filters

Insert the filters into the filter holder.

Insert the filters as far as possible into the unit and press lightly on the filter frames, so that they will fit tightly.

Push in the handles (A) so that the filters are clamped in place in the filter holder.

Carry out a filter calibration as described in Section 8.4.2.

18.2 Cleaning and Inspection

18.2.1 General

Clean the interior of the air handling unit as the need arises.

Inspect the air handling unit thoroughly at the same time that you replace the filters or at least twice a year.

18.2.2 Filter Space

Cleaning is most appropriate when you change the filters.

18.2.3 Heat exchangers

Check at least twice a year whether cleaning is necessary.

The cleaning work is carried out from the filter space.

The heat exchanger should preferably be cleaned by vacuum cleaning with a soft nozzle to prevent damaging the air passages in the rotor.

Turn the rotor by hand to enable you to vacuum clean its entire surface.

If the heat exchanger is substantially fouled, it can be blown clean with compressed air.

If necessary, the heat exchanger can be withdrawn from the unit casing and washed with degreasing solvent. Only service personnel trained by Swegon shall be permitted to use this cleaning method.

FABRIC SEAL

Lift up the fabric seal and inspect its underside. Clean if needed by brushing or vacuum cleaning.

If the fabric seal is worn or substantially fouled, it should be replaced. Do not lubricate it!

BELT TENSION

Replace the drive belt if it feels loose or worn and slightly slips if it meets resistance. Contact service personnel trained by Swegon!

18.2.4 Fans and Fan Space

Inspect and clean the fan impellers to remove possible dirt deposits.

Check the impeller to make sure that it is not out of balance.

Clean or brush off the fan motor. It can also be cleaned by carefully wiping it with a damp cloth that has been dipped in a solution of water and dishwashing detergent.

Clean the fan space, if needed.

18.3 Performance Checks

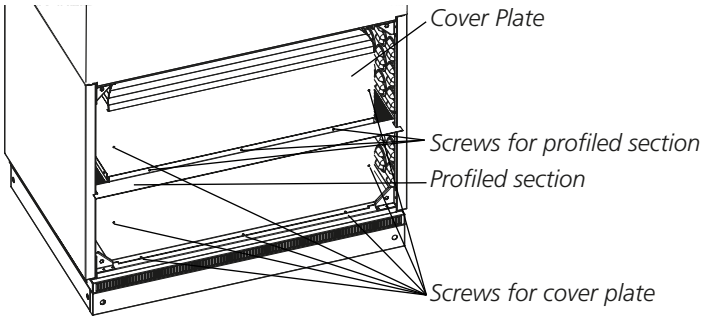
General performance checks should be carried out in conjunction with filter change or at least once a year.

It is then appropriate to compare the current performance values of the unit with the Commissioning Record. Eventual deviations should be remedied.

18.4 Damper Actuator for the Change-over Damper

Normally the damper actuator of the change-over damper does not require cleaning or maintenance. If in spite of this, access to the damper actuator is required, for example for checking that it operates correctly or replacement, see the description below.

1. Remove the four screws that hold the front grille of the lower section. Use a 6 mm Allen wrench. The screws are located within the outer holes in the corners.
2. Remove the three screws that hold the profiled section in front of the cover plate, see illustration.
3. Remove the seven screws that hold the cover plate and dismantle it, see illustration.
4. The valve actuator is now accessible.
2. Reassemble in the reverse order.



Registered design. The company reserves the right to make design changes without prior notice.

19 ALARMS AND FAULT TRACING

19.1 General

Alarms are indicated by an alarm text and flashing LED in the control display. Alarms for fire are shown in all the menu images. Other alarms are only shown if you are in the Main Menu.

Quick reading or active, but time-delayed, alarms can be viewed quickly at USER LEVEL under ALARMS. The 10 most recently initiated alarms can also be read in this menu.

A fault can be traced by examining the function or functional component indicated in the alarm text.

Faults can also be traced via the READINGS Menu or the MANUAL TEST Menu at Installation level.

If the fault cannot be immediately remedied:

Consider whether the air handling unit can continue to operate until the fault has been remedied. Choose to block the alarm and/or to change it from STOP to OPERATION (See Section 14, Alarm settings).

19.1.1 A and B Alarms

If selected, a type A alarm is indicated to the output for Alarm Relay A (inputs Inp. 1 and Inp. 2), see also Section 10.8.

If selected, a type B alarm is indicated to the output for Alarm Relay B (inputs Inp. 1 and Inp. 2), see also Section 10.8.

Alarms can be forwarded with different priority via these terminals.

19.1.2 To reset the alarm

Alarms that require manual resetting can be reset from the control display. Select RESET in the appropriate alarm menu.

Alarms that reset themselves automatically will do so as soon as the fault has been remedied.

Alarms can also be reset via a communication network.

19.1.3 To Change the Alarm Settings

See Section: 14 Alarm Settings.

19.2 Alarm Descriptions with Factory Settings

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
1	EXTERNAL FIRE ALARM TRIPPED For the fire protection function connected to inputs Inp. 1 or Inp. 2.	A****	1*	1	3 s	M
2	INTERNAL FIRE ALARM TRIPPED The air handling unit's supply air sensor measures a temperature more than 70 °C and/or its extract air sensor measures a temperature more than 50 °C. The function must be activated manually in the ALARM SETTINGS menu.	A ****	1*	1	3 s	M
4	R.HX.SPEED MONITOR TRIPPED No impulses from the rotation detector are registered with the heat exchanger controller. The air handling unit will be switched out only if the outdoor temperature drops below 5 °C.	A	0**	1	3 s	M
6 7	SUPPLY AIR TEMP SENSOR DEFECTIVE EXTRACT AIR TEMP SENSOR DEFECTIVE The supply air/extract air temperature sensor is not connected or is faulty.	A A	1 1	1 1	3 s 3 s	A A
8	OUTDOOR AIR TEMP SENSOR DEFECTIVE The outdoor air temperature sensor is not connected or is faulty.	B	0	1	3 s	A
9	NO COMMUNICATION TO R.HX. CONTROLLER The air handling unit's control unit cannot establish correct communication with the heat exchanger controller.	A***	1	1	10 s	A
10 11	NO COMMUNICATION TO SA FREQUENCY CONV. NO COMMUNICATION TO EA FREQUENCY CONV. The air handling unit's control unit cannot establish correct communication with frequency inverter.	A *** A ***	1 1	1 1	10 s 10 s	A A
12 13	OVER CURRENT IN SA FREQUENCY CONV. OVER CURRENT IN EA FREQUENCY CONV. Current above the normal level is supplied to the motors.	A *** A ***	1 1	1 1	3 s 3 s	M M
14 15	UNDER VOLTAGE IN SA FREQUENCY CONV. UNDER VOLTAGE IN EA FREQUENCY CONV. Voltage below the normal level is supplied.	A *** A ***	1 1	1 1	3 s 3 s	M M
18 19	OVER TEMPERATURE IN SA FREQUENCY CONV. OVER TEMPERATURE IN EA FREQUENCY CONV. High temperature inside the inverter.	A *** A ***	1 1	1 1	3 s 3 s	M M
20 21	NO COMMUNICATION WITH SA FREQUENCY CONV. GATEWAY NO COMMUNICATION WITH EA FREQUENCY CONV. GATEWAY The air handling unit's control unit cannot establish correct communication with the fan's communication gateway.	A*** A***	1 1	1 1	10 s 10 s	A A

** Not adjustable, always stops the air handling unit.*
*** Not adjustable, stops the air handling unit if the temperature to below +5 °C.*
**** Blocked if the hand terminal does not display the main menu.*
***** Cannot be blocked.*

Registered design. The company reserves the right to make design changes without prior notice.

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
22 23	SA FREQUENCY CONV. HALL SENSOR DEFECTIVE HALL SENSOR DEFECTIVE EA FREQUENCY CONV. Internal fault in hall sensor.	A*** A***	1 1	1 1	10 s 10 s	M M
24 25	EA FREQUENCY CONV. BLOCKED EA FREQUENCY CONV. BLOCKED. Motor does not rotate during start up.	A*** A***	1 1	1 1	3 s 3 s	M M
26 27	EA FREQUENCY CONV. START-UP FAILURE START-UP FAILURE EA FREQUENCY CONV. Wrong rotation during start up.	A*** A***	1 1	1 1	3 s 3 s	M M
30	EXT.EA/ROOM TEMP SENSOR DEFECTIVE Temperature sensor in extract air duct or room is not connected ("Internal bus 1" contact) or is faulty; or has been selected with communication. Applicable if the External sensor, extract air/room or Intermittent night-time heating function is selected.	A ***	1	1	3 s	A
31	EXT.OUTDOOR TEMP SENSOR DEFECTIVE Temperature sensor for outdoor temperature is not connected ("Internal bus 1" contact) or is faulty; or has been selected with communication. Applicable if the External outdoor sensor function is selected.	B ***	0	1	3 s	A
34	OVER CURRENT IN R.HX. CONTROLLER Current above the normal level is supplied to the rotary heat exchanger's drive motor.	A ***	1	1	3 s	M
35	UNDER VOLTAGE IN R.HX. CONTROLLER Feed voltage (25V) is supplied to the rotary heat exchanger's drive motor.	A ***	1	1	3 s	M
36	OVER VOLTAGE IN R.HX. CONTROLLER Voltage above the normal level (55 V) is supplied to the rotary heat exchanger's drive motor.	A ***	1	1	3 s	M
37	OVER TEMPERATURE IN R.HX. CONTROLLER High internal temperature (90°C for the rotary heat exchanger's controller).	A ***	1	1	3 s	M
38	R.HX. PRESSURE DROP ABOVE ALARM LIMIT The heat exchanger's defrosting function has operated for the full max period 6 times during one 24-hour period.	B ***	0	1	3 s	M
39	EL.HEATING COIL TRIPPED The thermal overload protection has tripped or is not connected.	A ***	1	1	3 s	M
40	EXTRACT AIR TEMP BELOW ALARM LIMIT The extract air temperature is below preset alarm limit for more than 20 minutes.	A ***	1	1	20 m	M
41	SUPPLY AIR TEMP BELOW SETPOINT The supply air temperature is below the preset setpoint (for ERS and Supply air regulation) or Min SA temp (for Extract air regulation) longer than 20 minutes.	A ***	1	1	20 m	M

**** Blocked if the hand terminal does not display the main menu.*

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
42	EXT. ALARM No.1 TRIPPED External alarm, connected to control unit input Inp. 1 or Inp. 2, has tripped.	A ***	1	1	Set time	M
43	EXT. ALARM No.2 TRIPPED External alarm, connected to control unit input Inp. 1 or Inp. 2, has tripped.	B ***	0	1	Set time	M
48 49	SUPPLY AIRFLOW BELOW SETPOINT EXTRACT AIRFLOW BELOW SETPOINT The supply/extract airflow has been more than 10% below its setpoint for more than 20 minutes.	B *** B ***	0 0	1 1	20 m 20 m	M M
50 51	SUPPLY AIRFLOW ABOVE SETPOINT EXTRACT AIRFLOW ABOVE SETPOINT The supply/extract airflow has been more than 10% above its setpoint for more than 20 minutes.	B *** B ***	0 0	1 1	20 m 20 m	M M
52 53	SUPPLY AIR FILTER DIRTY EXTRACT AIR FILTER DIRTY The pressure across the supply /extract air filters has exceeded the preset alarm limit for more than 10 minutes.	B *** B ***	0 0	1 1	10 m 10 m	M M
54	SERVICE PERIOD PAST ALARM LIMIT The preset service period has expired. If the alarm is RESET via the hand-held micro terminal, the alarm will be initiated again after 7 days. A new service period can be set in the ALARM SETTINGS menu.	B ***	0	1	Set time	M
55 56	NO COMM. SA AIR FLOW PRESSURE SENSOR NO COMM. EA AIR FLOW PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the supply/extract air flow pressure transducer.	A *** A ***	1 1	1 1	10 s 10 s	A A
57 58	NO COMM. SA FILTER PRESSURE SENSOR NO COMM. EA FILTER PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the supply/extract air filter pressure transducer.	B *** B ***	1 1	1 1	10 s 10 s	A A
61	NO COMM. R.HX. PRESSURE SENSOR The air handling unit's control unit cannot establish correct communication with the pressure transducer connected for the heat exchanger. Applicable to the defrosting function only.	B ***	0	1	10 s	A
62-71	NO COMMUNICATION TO I/O-MODUL NR 1–9 The air handling unit's control unit cannot establish correct communication with the connected I/O module 1–9	B ***	0	1	3 s	A
72	Correct communication can be established between the CPU circuit card and the control unit*s I/O processor.	A	1	1	30 s	A
85	COOLING OUTPUT 1 TRIPPED Broken signal is obtained at D11 for I/0-module 6. Motor protection or pressure switch may have tripped.	A	0	1	3 s	M

**** Blocked if the control display does not display the main menu.*

Registered design. The company reserves the right to make design changes without prior notice.

Alarm no.	Alarm text Function	Priority	Stop	Indication LED	Delay	Resetting
		0=blocked	0=In operat.	0=Off	s=seconds	M=manual
		A=A alarm	1=Stop	1=On	m=minutes	A=automatic
		B=B alarm				
86	COOLING OUTPUT 2 TRIPPED Broken signal is obtained at DI2 for I/0-module 6. The motor protection or pressure switch may have tripped.	A	0	1	3 s	M
99	TIME LOCK TRIPPED Contact Swegon or their representative.	–	–	–	–****	M
102	COOLING VALVE I/O-7 DEFECTIVE Controls of the Cooling valve do not obtain the same signal on AI 1 as on AU1 on I/O-module.	B***	1	0	10 m	M
103	HEATING VALVE I/O-7 DEFECTIVE Controls of the Heating valve do not obtain the same signal on AI 2 as on AU2 on I/O-module	A***	1	0	10 m	M
104	COOL. CIRCUIT PUMP I/O-7 TRIPPED. Controls of the cooling circuit pump do not obtain correct signal according to set function.	B***	1	0	30 s	M
105	HEAT. CIRCUIT PUMP I/O-7 TRIPPED Controls of the heating circuit pump do not obtain correct signal according to set function.	A***	1	1	30 s	M
106	COOLING WATER TEMP I/O-7 BELOW SET POINT Temperature for cooling water control on I/O module is continuously 7°C below its current set point.	B***	1	0	30 m	M
107	HEATING WATER TEMP I/O-7 BELOW SET POINT. Temperature for heating water control on I/O module is continuously 7°C below its current set point.	A***	1	0	30 m	M
108	COOLING WATER TEMP I/O-7 ABOVE SET POINT Temperature for cooling water control on I/O module is continuously 7°C above its current set point.	0***	1	0	30 m	M
109	HEATING WATER TEMP I/O-7 ABOVE SET POINT Temperature for heating water control on I/O module is continuously 7°C above its current set point.	0***	1	0	30 m	M
110	COOLING WATER TEMP SENSOR I/O-7 DEFECTIVE Obtained if the cooling water temperature sensor temp is not connected or is defective.	B	1	0	3 s	A
111	HEATING WATER TEMP SENSOR I/O-7 DEFECTIVE Obtained if the heating water temperature sensor is not connected or is defective.	A	1	0	3 s	A

**** Blocked if the hand terminal does not display the main menu.*
***** Adjustable: 0-99 months.*

20 INFORMATIVE MESSAGES

Informative messages are displayed in the control display. Informative messages are displayed only when the user is viewing the Main menu.

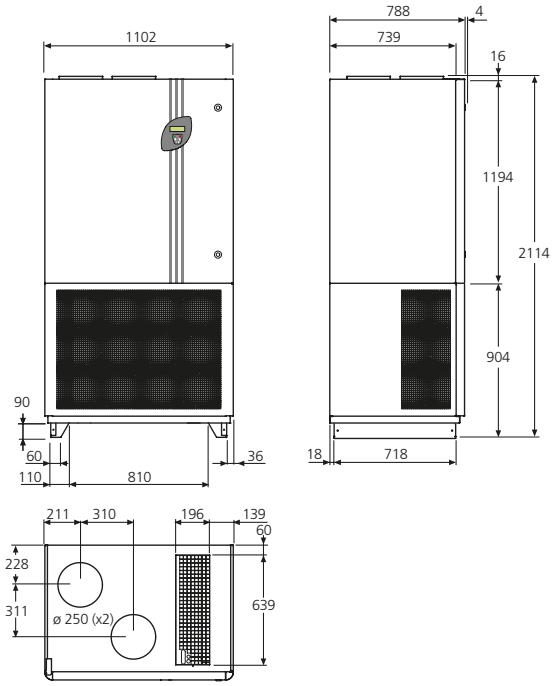
Informative messages provide particulars about necessary settings that have not been entered or unfavourable operating scenarios, for instance.

Message No.	Message Text
1	FILTER CALIBRATION NOT EXECUTED The pressure across the filters was not calibrated after the first start. Recurrent at 24-hour intervals. The message will not be received after the pressure across the filters has been calibrated.
2	H EXCH CALIBRATION NOT EXECUTED The pressure across the heat exchanger was not calibrated after the function was activated for the first time. Recurrent at 24-hour intervals. The message will not be received after the pressure across the heat exchanger has been calibrated.
3	SPARE
4	INCORRECT DIP SWITCH SETTINGS DIL switches on the control circuit card are set in a forbidden combination.
5	SPARE
6	E-MAIL ERROR Error in communication to the modem or error when e-mail is being delivered. The message will be displayed after ten attempts.
7	SPARE

Registered design. The company reserves the right to make design changes without prior notice.

21 TECHNICAL DATA

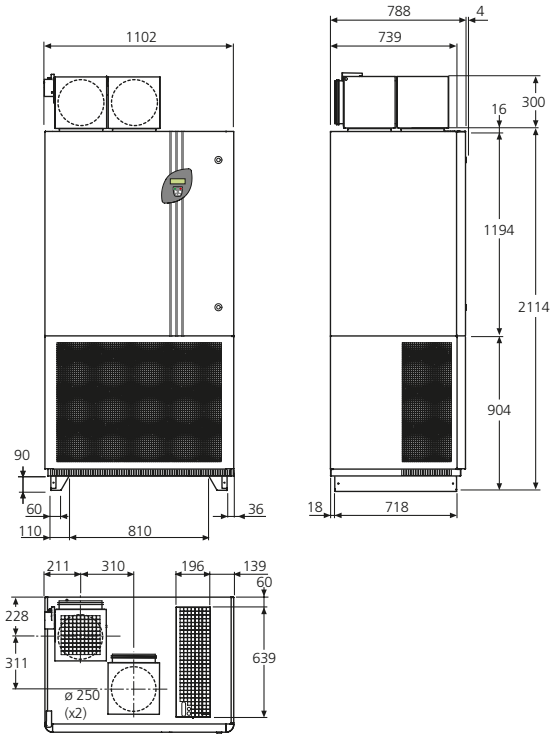
21.1 Dimensions, COMPACT Air



Overall weight: 331 kg Upper section: 214 kg, lower section: 117 kg

1,200 mm free space is required for opening the front panel (left-hand hung).

21.2 Dimensions, COMPACT Heat



Overall weight: 345 kg Upper section: 221 kg, lower section: 124 kg

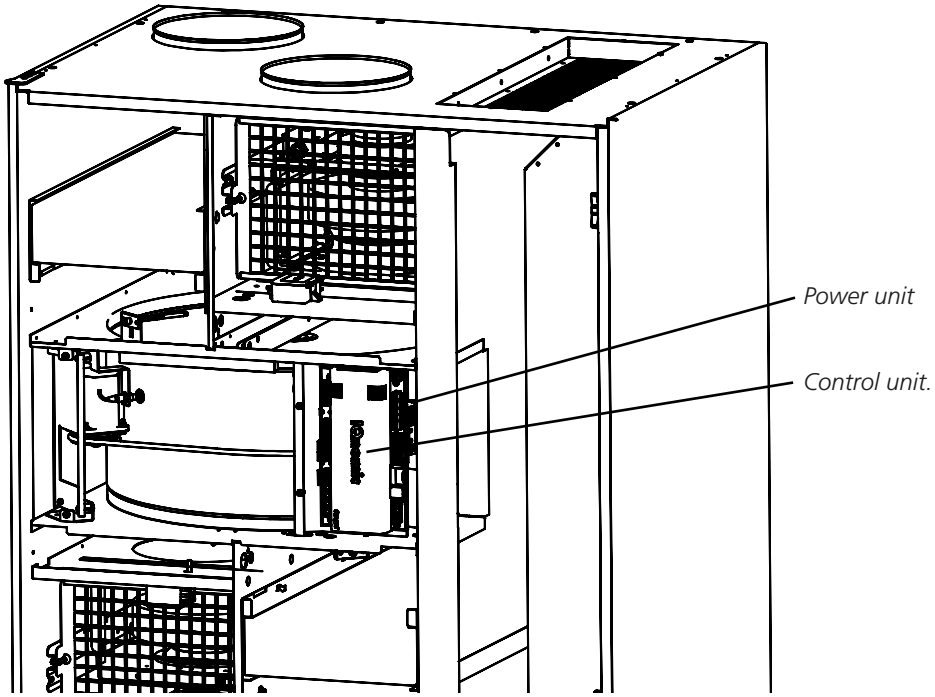
1,200 mm free space is required for opening the front panel (left-hand hung).

21.3 Electrical Equipment Cubicle

The electrical equipment cubicle contains two units: the control unit and the power unit.

The control unit is positioned behind the safety guard of the heat exchanger. The safety guard must be dismantled to gain access.

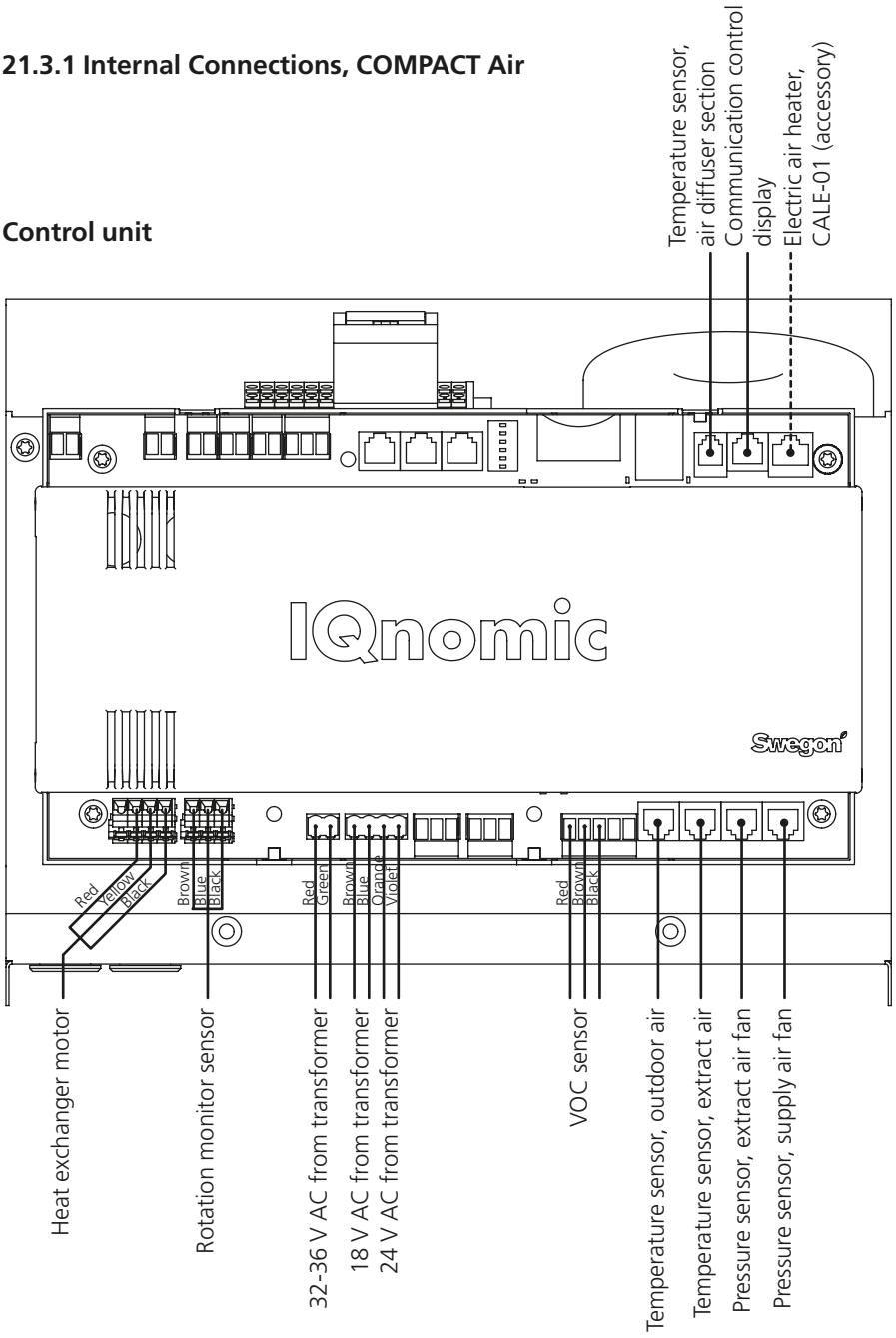
The power unit is positioned behind the control unit, accessible via the air handling unit's extract air duct. The cover panel must be dismantled to gain access.



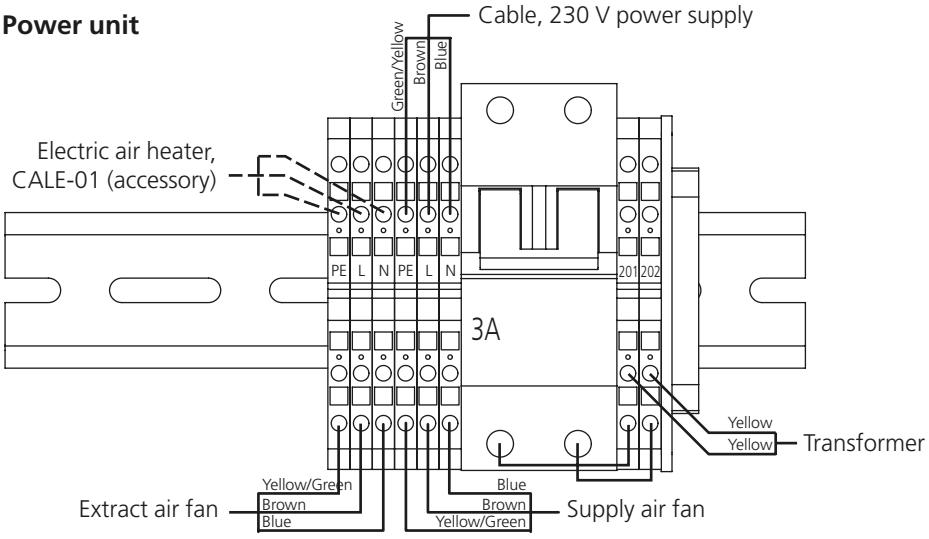
Registered design. The company reserves the right to make design changes without prior notice.

21.3.1 Internal Connections, COMPACT Air

Control unit

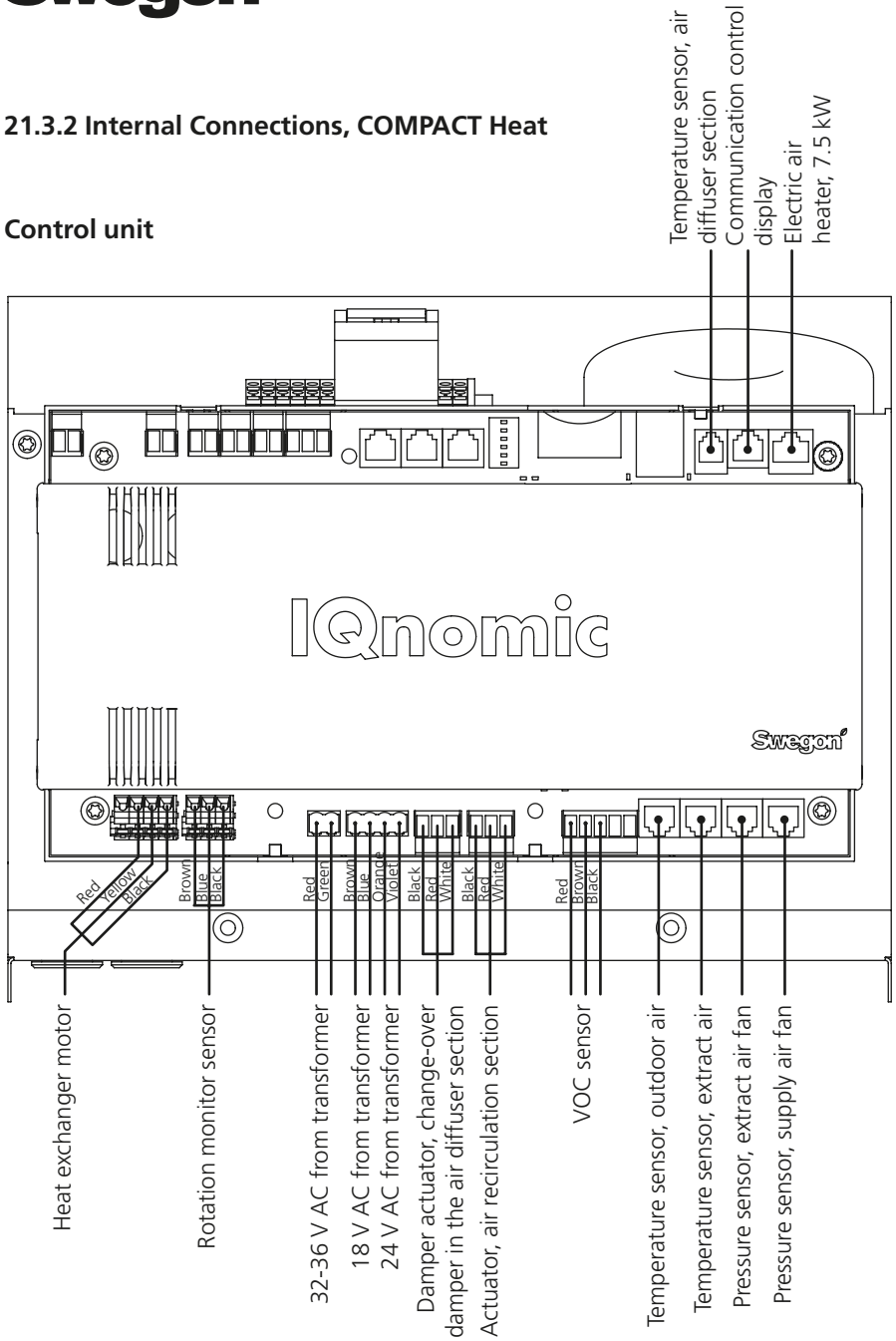


Power unit

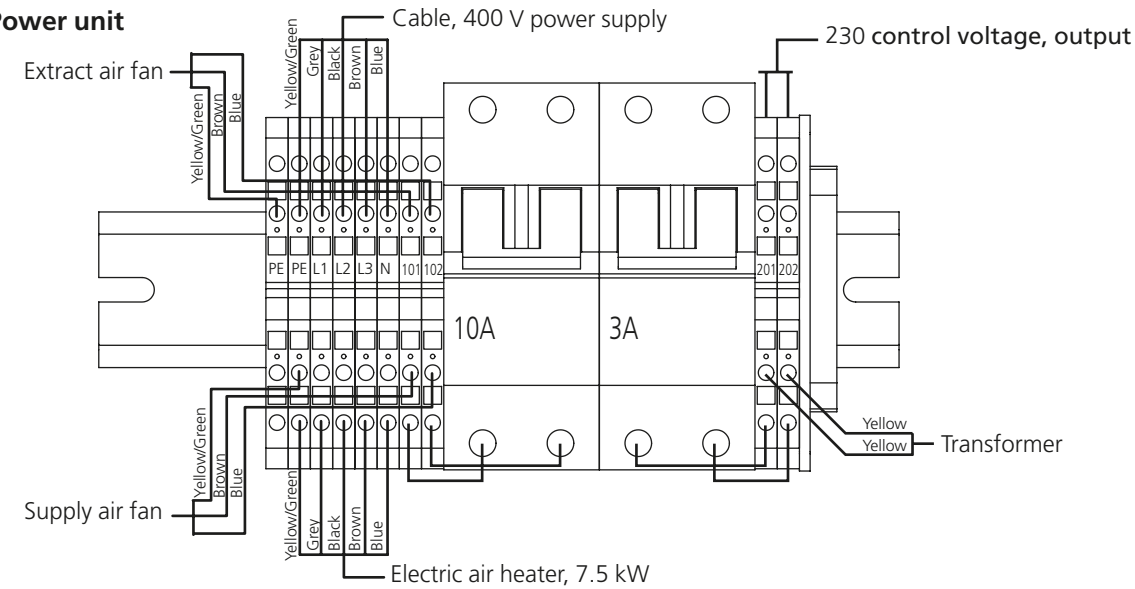


21.3.2 Internal Connections, COMPACT Heat

Control unit

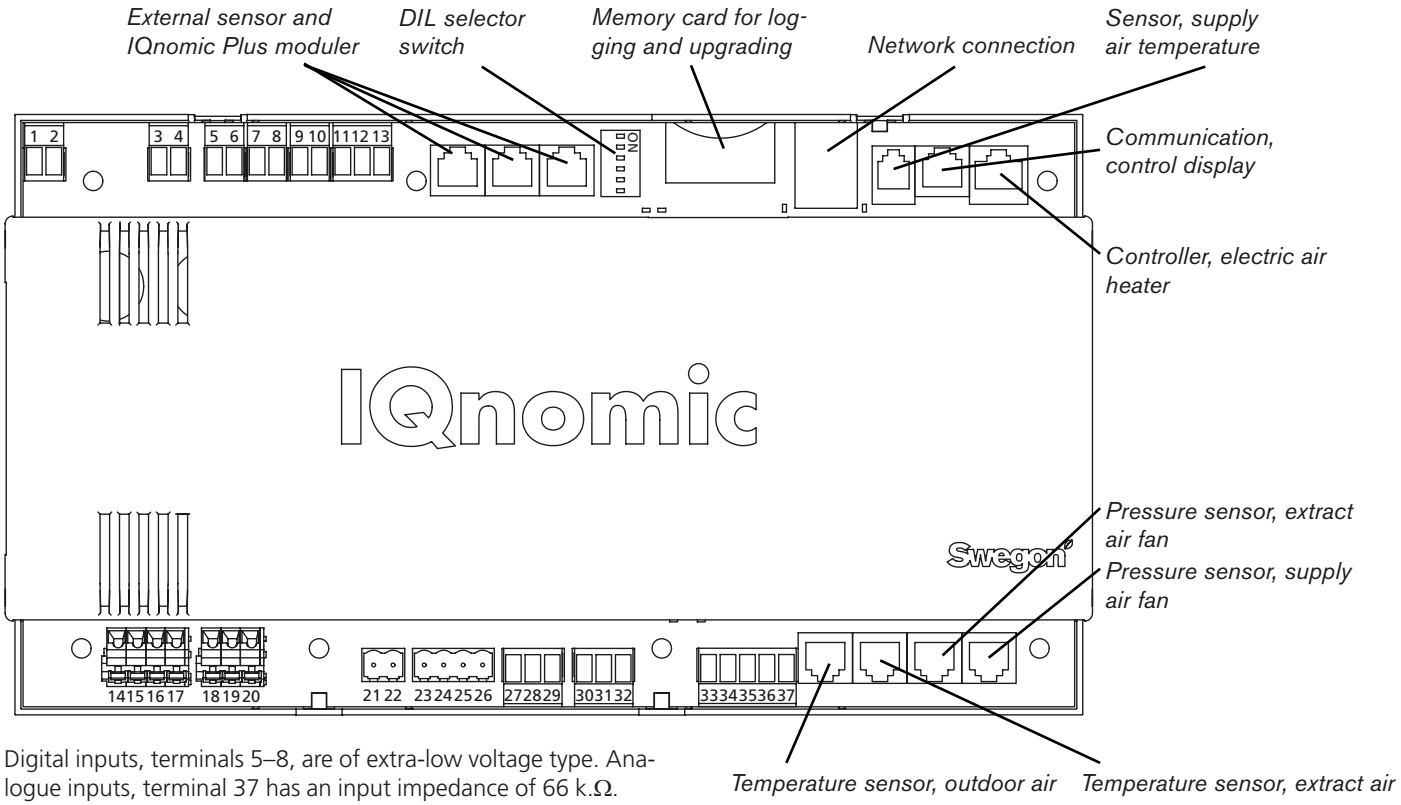


Power unit



Registered design. The company reserves the right to make design changes without prior notice.

21.3.3 Connection to Terminal Blocks



Digital inputs, terminals 5–8, are of extra-low voltage type. Analogue inputs, terminal 37 has an input impedance of 66 k.Ω.

Terminal	Function	Remarks
1,2	Output 1	Select function individually. Independent contact, max. 5 A/AC1, 1A/AC3, 250 V AC.
3,4	Output 2	Select function individually. Independent contact, max. 5 A/AC1, 1A/AC3, 250 V AC.
5,6	Input 1	Select function individually.
7,8	Input 2	Select function individually.
9,10	Control voltage	Control voltage: 24 V AC, max. permissible load : 28 VA.
11,12,13	Connections for EIA 485	11 communication connection A/RT+, 12 Communication connection B/RT-, 13 = GND/COM.
14,15,16, 17	Heat exchanger motor	14 Earth, 15 Red, 16 Yellow, 17 Black.
18,19,20	Rotation monitor sensor	18 Brown, 19 Blue, 20 Black.
21,22	H EXCH controls	Power supply: 36 V AC, in
23,24	Control unit.	Power supply: 18 V AC, in
25,26	Damper control	Power supply: 24 V AC, in
27,28,29	Damper actuator, change-over damper	27 (G0) Black 24 V AC(-), 28 (G) Red 24 V AC(+), 29 (NO) White 24 V AC out if active.
30,31,32	Damper actuator, air recirculation damper	30 (G0) Black 24 V AC(-), 31 (G) Red 24 V AC(+), 32 (NO) White 24 V AC out if active.
33, 34, 35	PWM input for Clean Air Control	VOC sensor. 33 +12 V DC. Max. 500 mA load. 34 PWM signal. 35 measuring zero, GND.
36	Output, fixed power supply: 10 V DC out	10 V DC to GND Max. permissible load: 20 mA.
37	Input, 0–10 V DC, for demand-controlled control of the airflow or set point displacement	Air quality sensor

DIL selector switch:
For COMPACT Air: all the DIL switches must be in the OFF position.
For COMPACT Heat: DIL switch 2 must be in the ON position, the other switches must be in the OFF position.

21.4 Electrical Data

21.4.1 Air Handling Unit

MIN. POWER SUPPLY
COMPACT Air:
1-phase, 3-wire, 230 V -10/+15%, 50 Hz, 10 AT

COMPACT Heat:
3-phase, 5-wire, 400 V -10/+15%, 50 Hz, 16 AT

21.4.2 Fans

RATED DATA PER FAN

COMPACT Air and COMPACT Heat
Size 02: 1 x 230 V, 50/60 Hz, 0.5 kW (0.28 kW)*
Size 03: 1 x 230 V, 50/60 Hz, 0.5 kW (0.43 kW)*
**) The motor controls limit the output power to the value specified.*

21.4.3 Electrical equipment cubicle

COMPACT Air:
One 2-pole 3A Automatic circuit breaker for 230V control current

COMPACT Heat:
One 2-pole 3A Automatic circuit breaker for 230V control current
One 2-pole 10A Automatic circuit breaker for control current to fans

21.4.4 Heat Exchanger Motor

COMPACT Air and COMPACT Heat:
Stepping motor, 3-phase, 5.8 A (2A)*, 62 V max 90 V.
**) The motor controls limit the output power to the value specified.*

21.4.5 Control Inaccuracy

Temperature ± 1°C.
Airflow ± 5%.

Registered design. The company reserves the right to make design changes without prior notice.

22 APPENDICES

22.1 Compliancy Declaration

We, Swegon AB

Box 300
S-535 23 Kvänum

declare under our own sole responsibility that

Air handling units with the following designation:
COMPACT Air, COMPACT Heat, COMPACT Unit, COMPACT Top
and any accessories to the respective designation covered by these directives

comply with the Machinery Directive 2006/42/EC

and also to the following directives

2004/108/EC EMC, (Electromagnetic Compatibility)
2006/95/EC LVD, (the Low Voltage Directive)

The following harmonised standards have been applied:

EN ISO 12100-1, -2 (Safety of machinery, general principles for design)
EN ISO 13857:2008 (Safety distances)
EN ISO 14121-1:2007 (Risk assessment)
EN 60204-1 (Electrical equipment of machines)
EN 61000-6-2, -3 (Electromagnetic compatibility)

The following other standards and specifications have been applied:

EN 1886:2007 (Ventilation for buildings, air handling units)
EN 13053:2006 (Ventilation for buildings, air handling)

Person authorised to compile the technical documentation:

Dan Örtengren
Box 300
535 23 Kvänum

This declaration is applicable only if the air handling unit(s) has/have been installed according to Swegon's instructions and provided that the air handling unit(s) has/have not been modified in any way.

Kvänum, 31/05/2010

Thord Gustafsson, Quality and Environmental Manager, Swegon AB

22.2 Commissioning Record

Company

Handling officer

Customer	Date	SO no.:
Plant	**Item/AHU**	**Item no.:**
Plant address	**Type/size**	**Program version:**

Filters calibrated ☐

Switch clock, current time preset ☐

Other control system _____

Switch clock time channel settings

Channel	Operating mode	Times	Week day
1	Low ☐ High ☐	: – :	:
2	Low ☐ High ☐	: – :	:
3	Low ☐ High ☐	: – :	:
4	Low ☐ High ☐	: – :	:
5	Low ☐ High ☐	: – :	:
6	Low ☐ High ☐	: – :	:
7	Low ☐ High ☐	: – :	:
8	Low ☐ High ☐	: – :	:

Switch clock year round settings

Channel	Operating mode	Times	Period
1	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
2	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
3	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
4	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
5	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
6	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
7	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –
8	☐ Inactive ☐ Stop ☐ High ☐ Low	: – :	/ – – / –

Registered design. The company reserves the right to make design changes without prior notice.

Function	Factory-preset value	Adjusted value
Temperature		
Temp. Regul. function	[X] ERS 1 [ ] ERS 2	[ ] ERS 1 [ ] ERS 2
Difference SA/EA (°C)	2,0	
Step	1	
Breakpoint (°C)	20,0	
X1	15,0	
Y1	20,0	
X2	20,0	
Y2	18,0	
X3	22,0	
Y3	14,0	
Airing	[ ] Inact. [X] Active	[ ] Inact. [ ] Active
SA temp. (°C)	10,0	
Time period	15 min.	
Summer Night Cooling	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
EA temp. start (°C)	22,0	
EA temp. stop (°C)	16,0	
Outdoor air temp. stop (°C)	10,0	
SA Setpoint (°C)	10,0	
In-op. time start (hh:mm):	23:00	
In-op. stop (hh:mm)	06:00	
Intermittent Night-time Heating 1)	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
EA/Room start (°C)	16,0	
EA/Room stop (°C)	18,0	
SA Night setpoint (°C)	28,0	
SA flow (m^3/s / Pa)	*6)*	
SA flow (m^3/s / Pa)	0,0	
Damper output:	=0	
Morning BOOST 1)		
Time (hh:mm)	00:00	
Damper	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
EA fan	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
EA/Room temp	22,0°C 9)	
EA min	15,0°C 9)	
SA max	28,0°C 9)	
Set point displacement	[X] Inactive [ ] Active	[ ] Inactive [ ] Active
Heating		
Time (hh:mm)	00:45	
EA/Room temp	22,0°C 9)	
EA min	15,0°C 9)	
SA max	28,0°C 9)	
External sensor		
External EA/Room	[X] Inact. [ ] IQnom [ ] Comm.	[ ] Inact. [ ] IQnom [ ] Comm.
External outdoor	[X] Inact. [ ] IQnom [ ] Comm.	[ ] Inact. [ ] IQnom [ ] Comm.
Alarm delay	5 min.	

Function		Factory-preset value	Adjusted value
Flow/pressure			
Fan Regulation, SA*		[X] Flow [ ] Need [ ] Slave	[ ] Flow [ ] Need [ ] Slave
Fan Regulation, EA*		[X] Flow [ ] Need [ ] Slave	[ ] Flow [ ] Need [ ] Slave
Flow, low speed*	SA	*7)*	*7)*
	EA	*7)*	*7)*
Flow, high speed*	SA	*8)*	*8)*
	EA	*8)*	*8)*
Flow, max speed	SA	*2)*	*2)*
	EA	*2)*	*2)*
Flow, min. speed	SA	*3)*	
	EA	*3)*	
Demand-contr., low speed	SA (%)	50	
	EA (%)	50	
Demand-contr., high speed	SA	30	
	EA (%)	30	
Clean Air Control		[ ] Inact. [X] Active	[ ] Inact. [ ] Active
Outdoor temp. compensation		[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Flow			
Winter comp. Y1 (%)		30	
End point, winter X1 (°C)		-20	
Start. point, winter X2 (°C)		10	
Down-speed regulation			
Function		[ ] Inact. [X] SA [ ] SA + EA	[ ] Inact. [ ] SA [ ] SA + EA
Neutral zone (°C)		0,0	
Filters			
Standard filter		[ ] Inact. [ ] SA [ ] EA [X] SA+EA	[ ] Inact. [ ] SA [ ] EA [ ] SA+EA
In-operation			
Timer function		[X] 1. Low – high [ ] 2. Stop – low – high	[ ] 1. Low – high [ ] 2. Stop - low - high
Extended operation			
External low speed (h:mm)		0:00	
External low speed (h:mm)		0:00	
Manual overtime (h:mm)		0:45	
Summer/winter time		[ ] Inact. [X] Active	[ ] Inact. [ ] Active
Heating			
Heat exchanger			
Defrosting		[X] Inact. [ ] Active	[ ] Inact. [ ] Active

* Not used for Clean Air Control

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Function		Factory-preset value	Adjusted value
"Heating BOOST"			
Function, Off/On		[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Start limit, SA temp. (°C)		3,0	
Ramp time (%)		2.5	
Cooling		[X] Inactive [ ] Auto operation	[ ] Inactive [ ] Auto operation
Cooling unit controls		[ ] Stepless 0-10 V [ ] Stepless 10-0 V [X] On/off 1-step [ ] On/off 2-step [ ] On/off 3-step binary mode	[ ] Stepless 0-10 V [ ] Stepless 10-0 V [ ] On/off 1-step [ ] On/off 2-step [ ] On/off 3-step binary mode
Exercizing	Cooling relay 1	[X] Inact. [ ] Pump [ ] P+V [ ] Valve	[ ] Inact. [ ] Pump [ ] P+V [ ] Valve
	Cooling relay 2	[X] Inact. [ ] Pump [ ] P+V [ ] Valve	[ ] Inact. [ ] Pump [ ] P+V [ ] Valve
Exercise period		3 Min.	
Interval		24 hrs.	
Control reaction speed			
Step duration (s)		300	
Outdoor temp. limit	Step 1 (°C)	3,0	
	Step 2 (°C)	5,0	
	Step 3 (°C)	7,0	
Reset time (s)		480	
Cool. min. SA flow (m³s)		008	
Cool. min. EA flow (m³s)		0,08	
Neutral zone (°C)		2,0	
"Cooling BOOST"		[X] Inact. [ ] Comf. [ ] Econ. [ ] Sequ. [ ] Comf.+econ. [ ] Econ.+sequ.	[ ] Inact. [ ] Comf. [ ] Econ. [ ] Sequ. [ ] Comf.+econ. [ ] Econ.+sequ.
Start limit SA temp. (°C)		3,0	
Ramp time	(%)	2.5	
Inputs/Outputs			
Relay 1		A Alarm output 4)	
Relay 2		B Alarm output 4)	
Input 1		External low speed 5)	
Input 2		External high speed 5)	
"IQnomic Plus"			
I/O Module No. 0	Input/Output connections	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
I/O Module No. 3	Ext. monitoring	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
I/O Module No. 6	Cooling	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
I/O Module No. 7	AYC	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Alarm setting			
Fire alarm function			
Internal fire alarms		[X] Inact. [ ] Active	[ ] Inact. [ ] Active
External fire alarm	Alarm resetting	[X] Man. [ ] Auto	[ ] Man. [ ] Auto
Fan op. in the event of a fire		[X] Inact. [ ] SA [ ] EA [ ] SA+EA	[ ] Inact. [ ] SA [ ] EA [ ] SA+EA
SA fan speed in event of fire (%)		100	
EA fan speed in event of fire (%)		100	

Function	Factory preset value	Adjusted value
All Year Comfort	[X] Inact. [ ] Cool. [ ] Heat. [ ] C+H	[ ] Inact. [ ] Cool. [ ] Heat. [ ] C+H
Heating water temp. (°C)	30	
Cooling water temp. (°C)	14	
Outdoor comp., Heating water	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Outdoor temp. (X1) (°C)	-20	
Heating water (Y1)(°C)	40	
Outdoor temp. (X2)(°C)	5	
Heating water (Y2)(°C)	30	
Outdoor temp. (X3)(°C)	15	
Heating water (Y3)(°C)	20	
Outdoor comp., Cooling water	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Outdoor temp. (X1) (°C)	10	
Cooling water (Y1)(°C)	22	
Outdoor temp. (X2)(°C)	20	
Cooling water (Y2)(°C)	18	
Outdoor temp. (X3)(°C)	25	
Cooling water (Y3)(°C)	14	
Room comp., Heating water	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Room temperature (°C)	21	
P-band (°C)	5	
Night blocking	[ ] Inact. [ ] Active	[ ] Inact. [ ] Active
Room comp., Cooling water	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Room temperature (°C)	21	
P-band (°C)	5	
Night blocking	[ ] Inact. [ ] Active	[ ] Inact. [ ] Active
Night comp., Heating water	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Temp. comp. (°C)	-2	
Night comp., Cooling water	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Temp. comp. (°C)	2	
Night comp.	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Channel 1, Start, Stop, Weekday	Inactive	
Channel 2, Start, Stop, Weekday	Inactive	
Pump operation, Heating water		
Outdoor temp. Start (°C)	15	
Outdoor temp. Stop (°C)	18	
Pump operation, Cooling water		
Outdoor temp. Start (°C)	-20	
Outdoor temp. Stop (°C)	-25	
Alarm function, Heating water		
Pump alarm	[X] Inact. [ ] Open [ ] Close [ ] Cont.	[ ] Inact. [ ] Open [ ] Close [ ] Cont.
Valve	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Alarm function, Cooling water		
Pump alarm	[X] Inact. [ ] Open [ ] Close [ ] Cont.	[ ] Inact. [ ] Open [ ] Close [ ] Cont.
Valve	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Exercising, Heating water	[X] Inact. [ ] Pump [ ] P+V [ ] Valve	[ ] Inact. [ ] Pump [ ] P+V [ ] Valve
Exercising period, (min)	3	
Interval (h)	24	
Exercising, Cooling water	[X] Inact. [ ] Pump [ ] P+V [ ] Valvev	[ ] Inact. [ ] Pump [ ] P+V [ ] Valve
Exercising period, (min)	3	
Interval (h)	24	
Dew point comp.	[X] Inact. [ ] Active	[ ] Inact. [ ] Active
Neutral zone (°C)	2	
Comp. air flow (%)	10	

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Function	Factory-preset value	Adjusted value
External alarms		
Time delay Alarm 1 (s)	10	
Alarm on closure, Alarm 1	1	
Alarm reset	[X] Man. [ ] Auto	[ ] Man. [ ] Auto
Time delay Alarm 2 (s)	10	
Alarm on closure, Alarm 2	1	
Alarm reset	[X] Man. [ ] Auto	[ ] Man. [ ] Auto
Alarm limit temperature		
Deviation SA setpoint	5,0	
Min. EA temperature	15,0	
Filter function		
Filter alarm limit		
SA (%/Pa)	10/100	
EA (%/Pa)	10/100	
H EXCH defrosting		
Alarm limit (Pa)	50	
Service period		
Alarm limit (month)	12	
Alarm priority *See the following pages*	-	
Control display setting		
Language	English	
Flow unit	[ ] l/s [X] m³/s [ ] m³/h	[ ] l/s [ ] m³/s [ ] m³/h
Min./max. setting		
Break point, ERS Regulation (Control) (°C)	15,0/23,0	
Difference SA/EA (°C)	1,0/5,0	
Initial setting	–	
Communication		
EIA-485		
Protocol	Modbus RTU	
Address	1	
	PLA (Exoline) 1	
	ELA (Exoline) 1	
Speed	9600	
Parity	None	
Stop bit	1	
Ethernet		
Mac Id	Individual	
DHCP server	Inactive	
IP address	10.200.1.1	
Port no.	80	
Net mask	255.0.0.0	
GateWay	000.000.000.000	
DNS server		
NO. 1	000.000.000.000	
NO. 2	000.000.000.000	
Modbus TCP		
IP address	000.000.000.000	
Port no.	502	
Net mask	000.000.000.000	
BACnet IP		
Funktion	Ej aktiv	
Device ID	0000000	
Port nr.	47808	

The values refer to the sizes in due succession: 02, 03.
1) Applies to COMPACT Heat only
2) Only in combination with Cooling BOOST. 0,2 m3/s, 0,3 m3/s.
3) Only in combination with Demand control. 0,08 m3/s, 0,08 m3/s.
4) Possible options: Control of outdoor air/exhaust air damper, in-operation indication, low speed operation indication, indication or high speed operation, group alarm A, group alarm B, control of external heating, control of external cooling.
5) Possible options: External stop, external low speed operation, external high speed operation, external alarm 1, external alarm 2, external reset, external heating, external fire alarm.
6) 0,1 m3/s, 0,25 m3/s.
7) 0,1 m3/s, 0,15 m3/s.
8) 0,15 m3/s, 0,25 m3/s.
9) Same setting in both Morning Boost and Heating.

Alarm No.:	Function	Factory preset value			Adjusted value		
		Priority	Indication	Effect	Priority	Indication	Effect
		0=blocked	LED	0=Operat.	0=blockedt	LED	0=Operat.
		A=A alarm	0=Off	1=Stop	A=A alarm	0=Off	1=Stop
		B=B alarm	1=On		B=B alarm	1=On	
1	External fire alarm tripped	A****	1	1*			
2	Internal fire alarm tripped	A****	1	1*			
4	R.HX. speed monitor tripped	A	1	0**			
6	Supply air temp sensor defective	A	1	1			
7	Extract air temp sensor defective	A	1	1			
8	Outdoor air temp sensor defective	B	1	0			
9	No communication to r.hx. controller	A ***	1	1			
10	No communication to SA frequency conv.	A ***	1	1			
11	No communication to EA frequency conv.	A ***	1	1			
12	Over current in SA frequency conv.	A ***	1	1			
13	Over current in EA frequency conv.	A ***	1	1			
14	Under voltage in SA frequency conv.	A ***	1	1			
15	Under voltage in EA frequency conv.	A ***	1	1			
18	Over temperature in SA frequency conv.	A ***	1	1			
19	Over temperature in EA frequency conv.	A ***	1	1			
20	No communication SA frequency range gateway	A***	1	1			
21	No communication EA frequency range gateway	A***	1	1			
22	Hall sensor defective SA frequency range	A***	1	1			
23	Hall sensor defective EA frequency range	A***	1	1			
24	SA frequency range blocked	A***	1	1			
25	EA frequency range blocked	A***	1	1			
26	Start-up failure SA frequency range	A***	1	1			
27	Over voltage in EA-2 frequency conv.	A ***	1	1			
30	Ext. EA/room temp sensor defective	A ***	1	1			
31	Ext. outdoor temp sensor defective	B ***	1	0			
34	Over current in r.hx. controller	A ***	1	1			
35	Under voltage in r.hx. controller	A ***	1	1			
36	Over voltage in r.hx. controller	A ***	1	1			
37	Over temperature in r.hx. controller	A ***	1	1			
38	R.hx pressure drop above alarm limit	B ***	1	0			
39	El.heating coil tripped	A ***	1	1			
40	Extract air temp below alarm limit	A ***	1	1			
41	Supply air temp below setpoint	A ***	1	1			
42	Ext.alarm No.1 tripped	A ***	1	1			
43	Ext. alarm No.2 tripped	B***	1	0			
48	Supply airflow below setpoint	B ***	1	0			
49	Extract airflow below setpoint	B ***	1	0			
50	Supply airflow above setpoint	B ***	1	0			
51	Extract airflow above setpoint	B ***	1	0			
52	Supply air filter dirty	B ***	1	0			
53	Extract air filter dirty	B ***	1	0			
54	Service period past alarm limit	B ***	1	0			
55	No comm. SA air flow pressure sensor	A ***	1	1			
56	No comm. EA air flow pressure sensor	A***	1	1			

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Alarm No.:	Function	Factory preset value			Adjusted value		
		Priority	Indication	Effect	Priority	Indication	Effect
		0=blocked	LED	0=Operat.	0=blockedt	LED	0=Operat.
		A=A alarm	0=Off	1=Stop	A=A alarm	0=Off	1=Stop
		B=B alarm	1=On		B=B alarm	1=On	
57	No comm. SA filter pressure sensor	B***	1	0			
58	No comm. EA filter pressure sensor	B ***	1	0			
61	No comm. r.hx. pressure sensor	B ***	1	0			
62	No communication to I/O-module No:0	B ***	1	0			
63	No communication to I/O-module No:1	B ***	1	0			
64	No communication to I/O-module No:2	B ***	1	0			
65	No communication to I/O-module No:3	B ***	1	0			
66	No communication to I/O-module No:4	B ***	1	0			
67	No communication to I/O-module No:5	B ***	1	0			
68	No communication to I/O-module No:6	B ***	1	0			
69	No communication to I/O-module No:7	B ***	1	0			
70	No communication to I/O-module No:8	B ***	1	0			
71	No communication to I/O-module No:9	B ***	1	0			
72	No communication to main controller I/O	A	1	1			
85	Cooling Output 1 tripped	A	1	0			
86	Cooling Output 2 tripped	A	1	0			
99	Time lock tripped	A	1	1			
102	Cooling valve I/O-7 defective	B***	1	0			
103	Heating valve I/O-7 defective	A***	1	0			
104	Cool. circuit pump I/O-7 tripped	B***	1	0			
105	Heat. circuit pump I/O-7 tripped	A***	1	1			
106	Cooling water temp. I/O-7 below set point	B***	1	0			
107	Heat. water temp. l I/O-7 below set point	A***	1	0			
108	Cooling water temp. I/O-7 above set point	0***	1	0			
109	Heating water temp. I/O-7 above set point	0***	1	0			
110	Cooling water temp. sensor I/0-7 defective	B	1	0			
111	Heating water temp. sensor I/0-7 defective	A	1	0			

** Not adjustable, always stops the air handling unit*
*** Not adjustable, stops the air handling unit at temperature below +5 °C*
**** Blocked if the hand terminal does not display the main menu.*
***** Cannot be blocked.*

Adjustments carried out by:

Date _____

Company _____

Name _____

22.3 Ecodesign data

AHU data		Data according to ErP directive in technical documentation and free access webpage													
Type	Size	Installation category	Efficiency category	Vaiable speed drive	Specific ratio	Overall efficiency ηe(s)			Efficiency grade N			Power input Ped	Air Flow qv	Pressure increase pfs	Speed n
						Actual	Req 2013	Req 2015	Actual	Req 2013	Req 2015	kW	m³/s	Pa	min⁻¹
COMPACT	02	A	Static	Yes	1,00	49,9	41,5	45,5	66,5	58	62	0,268	0,290	410	2690
	03	A	Static	Yes	1,01	51,0	42,9	46,9	66,2	58	62	0,361	0,323	510	3000

All documentation is available in digital form and can be downloaded from www.swegon.com

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